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BLUE JAY

Volume 72 Number 1

March 2014

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no.1
2014

SCI/TECH

Front Cover: *Snowy owl*	*- Randy McCulloch*
Back Cover: Crambus *moth*	*- Harvey Schmidt*

Prairie crocus *- Nick Saunders*

Gravestone lichen *- Bernard de Vries*

Blue Jay

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72nd ANNUAL SASKATCHEWAN CHRISTMAS BIRD COUNT - 2013

ALAN R. SMITH, Box 154, Avonlea, SK, S0H 0C0, Email: *alanrandi@sasktel.net*

The Counts. We would like to dedicate the 2013 edition of the Saskatchewan Christmas Bird Count to the memory of Shirley Jowsey. Shirley and her husband Jim have been involved in the Saltcoats Count since 1967; this winter's was to be her last. Our condolences go out to Jim and his family.

The 85 counts conducted this winter were the fewest since 2009. One new count at Round Lake near Prince Albert and a few "revived" counts did not make up for the loss of about 10 counts that had been done over the last several years. Not only were fewer counts done, but also the numbers of observers (736 vs. 845) and observer hours (1546 vs. 1848) were down substantially over last year. Most of the blame for this poor showing can be placed squarely on the weather.

The Weather. Temperatures and snow depth this winter were comparable to last winter's; the real killer was the winds, which sent wind chills on many counts into territory dangerous to both man and beast. Many observers were content to stay home and watch their feeders raising the time spent watching feeders to a record 40% of total observation time.

Average minimum and maximum count temperatures this past count period were -21 to -14°C (-18 to -12°C in 2012-13), snow depths 18 to 34 cm (17 to 34 cm in 2012-13) and wind speeds 10 to 23 km/h (4 to 12 km/h in 2012-13).

The Birds. Not surprisingly the 95,689 birds counted was far below the 10-year average of 119,000 birds. After setting a record in the average number of species per count at 19.4 last year, this winter's count fell to 16.1, and below the long-term average of 17.4. The overall number of species (96 on count day plus five additional) was, however, about average.

For the twelfth consecutive year Saskatoon led with 40 species on count day plus two more during the count period; Gardiner Dam was a close runner up with 38 species.

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Population Trends. Aside from the decline in overall numbers and diversity, there were few notable changes in the numbers of individual species over previous years (Table 7). There were, however, some pleasant surprises.

Counts of Sharp-tailed Grouse were up markedly; Weyburn (206 birds) and Grasslands N. P. (277 birds) set records for their respective vegetation zones of the Mixed Prairie and Dry Mixed Prairie. Two Greater Sage-Grouse in Grasslands N. P. were the first seen since 2007 at Govenlock.

The invasion continues for the Eurasian Collared-Dove. A record 558 birds appeared on a record 25 counts including new localities at Indian Head and Saltcoats. Since the first CBC records at Regina and Weyburn in 1999 it has shown up at 30 localities. Single Northern Cardinals were seen on a record high three counts: Craven, Prince Albert and the nearby Nisbet Forest.

After last year's peak numbers of finches, numbers crashed to below long-term levels. The American Goldfinch and House Finch bucked the trend. The goldfinch was up markedly; perhaps in the absence of competition from redpolls and Pine Siskins. The House Finch was up only slightly, its numbers stabilizing over the last six years.

New Species. A Great Black-backed Gull at Gardiner Dam on 16 December is the first record on the CBC and only the ninth provincial record. The CBC list now stands at 186 species.

Other Rarities. Outstanding rarities include the CBCs second Cassin's Finch at Saskatoon (the previous record was from Fort Walsh in 1983) and a fourth Red-bellied Woodpecker at Grenfell. For other rarities see Table 6.

Count areas and participants
(Names of compilers are in italics).

1. ARCHERWILL. Betty Clark, Wayne Clark, Gerald Hiron, Susan Hiron, Audrey Hnetka, Perry Hnetka, *Elaine Hughes*, Dave Kaiser, Joan Kaiser, Dorothy Klettberg, Willie Klettberg, Cecil Reimer, Mary Reimer.

2. AVONLEA. *Alan Smith,* Blaine Sudom.

3. BALGONIE. Jared Clarke, Fran Kerbs, *Brett Quiring*, Mary Worel.

4. BANGOR. *Allan Bolton, Lynn Bolton,* Aileen Hayward, Alan Hayward, John Maddaford,

Leslie Maddaford, Bev McLaren, Raye McLaren.

5. BIGGAR. Greg Goring, Linda Schnedar, Lorrie Sielski, *Guy Wapple*, Marguerite Wapple, Rob Wapple, Sandra Wapple.

6. BIRCH HILLS. Carman Dodge, Margaret Mareschal, *Maurice Mareschal.*

7. BORDEN-RADISSSON. Bev Beland, Orville Beland, Heather Giroux, Kyron Giroux, Ron Jensen, Jennipher Karst, Nick Saunders, *Stan Shadick*.

8. BROADVIEW. Doug Boivin, Carman Dodge, Mary Ann Pearson, Barb Weidl, *Don Weidl*.

9. CATER. Beverly Beland, *Orval Beland,* Jim Johnson, Wilma Johnson, Donna Long, Waldy Long.

10. CHATSWORTH S.D. *George Murray*, Laurie Murray, Henri Rooke, Stewart Rooke, Carol Tangedal, Rudy Tangedal.

11. CLARK'S CROSSING. Dave Cook, Louise Cook, Lorne Duczek, Lesley Fell, Heather Giroux, Kyron Giroux, May Haga, Terry Hams, Marilyn Haskins, Ron Jensen, Robert Johanson, Heney Klypak, Gordon Koshinsky, Margaret Koshinsky, John Patterson, Sylvia Raginski, Nick Saunders, Jan Shadick, Stan Shadick, Marten Stoffel, Guy Wapple, *Michael Williams*.

12. CORONACH. *Ryan Dudragne*, Bob Luterbach.

13. CRAVEN. Jody Broughton, Stephane Canevet, Jim Cummings, Donna Grohs, Chris Harris, *Trevor Herriot,* Louise Holloway, Phil Holloway, Fran Kerbs, Bob Luterbach, Barbara Mader, Kim Mann, Amelia McDonald, Jaret McDonald, Barry Mitschke, Kevin Moore, Curtis Pollock, Brett Quiring, Jeanette Taylor, Rob Taylor.

14. CREIGHTON. Karen Prokopetz, *Brenda Schmidt*, Harvey Schmidt, Terry Smith.

15. CROOKED LAKE. *Boyd Metzler.*

16. CROOKED RIVER. Helen Carson, Lyle Carson, Burnie Lewis, Joyce Lewis, *Margaret Mehler,* Morley Mehler.

17. CYPRESS HILLS PROVINCIAL PARK (Centre Block). Dwight Dobson, Nancy Dobson, David Larson, Margarette Larson, Marcia Love, Brynne Martin, Mimi Martin, *Melody Nagel-Hisey,* Cassidy Schock, John Schock.

18. DENHOLM. Beverly Beland, Gerard Beland, Linda Beland, *Orval Beland.*

19. EASTEND. Roxie Binkley, Kevin Bristow, Diane Dohei, Tom Donald, Cynthia Fehr, *Robert Gebhardt,* John Hanlin, June Higgins, John McIntyre, Ed Sanford, Mary Thomson, Heidi Topham, Eldon Wig.

20. EDENWOLD. *Jocelyn Hextall.*

21. ENDEAVOUR. *Norman Harris.*

22. ESTEVAN. Alaina Armbruster, Barry Dies, Marilyn Dies, Ryan Dudragne, Kathy Hedegard, Larry Preddy, Dan Sawatzky, *Guy Wapple.*

23. ESTUARY NORTH. Cathy Cocks, *Dean Franci*s, Fran Francis.

24. FENTON. *Carman Dodge.*

25. FLORAL. Nick Saunders, *Guy Wapple.*

26. FORT QU'APPELLE. Jim Armstrong, Peter Ashcroft, Jean Ashcroft, Shawn Baldock, Darryl Hamilton, Alice Isfan, Jack Lowe, Tom McDougal, Alan Mlazgar, Denise Mlazgar, Wendy Paquin, Florance Pearpoint, *Keith Stephens*, Colette Stushnoff, Bill Wendal, Glenn Zimmer.

27. GARDINER DAM. Greg Fenty, Maxine Forsberg, Donna Grohs, Ron Jensen, Kevin Moore, Nick Saunders, Stan Shadick, Marten Stoffel, Phil Taylor, *Guy Wapple.*

28. GOOD SPIRIT LAKE. *Bill Anaka,* Dorothy Riesz, Ray Riesz, Lloyd Wilson, Marg Wilson.

29. GRANDORA. *Verna Messer.*

30. GRASSLANDS NATIONAL PARK. *Michael Fitzsimmons,* Carolyn Gaudet, Robert Harwood, Ryan Hayes, Kyra Hiltz, Laura James, Johane Janelle, Catherine Macauley, Dennis Morgan, Wes Olson, Heather Sauder, Sarah Tyne.

31. GRAYSON. Carina Helm, *Charles Helm*, Daniel Helm, Linda Helm, Jeanette Zimmer, Karl Zimmer.

32. GRENFELL. Ethel Reiger, Barb Weidl, *Don Weidl.*

33. HARRIS. Ron Jensen, Nick Saunders, *Guy Wapple.*

34. HAZLET. Laurent Dudragne, *Ryan Dudragne.*

35. HUDSON BAY. *John Daisley,* Darlene Dickson, Ernie Krajic, Agnes Lewellin, Bev Soules, Gloria Stang, John Zolkavich.

36. INDIAN HEAD. Jan Beatty, Kay Dixon, Mike Duran, *Irv Escott,* Sharon Hearn, Jim Jinks, Linda Jinks, John Kort, Linda Kort, Peter Kort, Dan Loran, Dora Nichols, Lorette Schaeffer, Raymond Schaeffer, Bob Scott, Brian Scott, Glenn Scott, Lorne Scott, Chris Skinner, Fred Skinner, Donna Thompson, Sandra Vander Schaat, Shirley Vander Schaat.

37. KENASTON. Margaret Beckie, *P. Lawrence Beckie.*

38. KENOSEE LAKE. Boyd Metzler, *John Pollock.*

39. KETCHEN NORTH. *Dallas Fairburn.*

40. KILWINNING. *Ed Driver*, Margaret Driver.

41. KINDERSLEY NORTH. *Jean Harris*, Keith Harris.

42. KINLOCH. *Don Forbes,* Doreen Forbes, Clifford Logan, Doreen Wickstrom, Ronald Wickstrom.

43. KYLE. Arlene Campbell, David Hamilton, Sig Jordheim, Greg Nelson, Yvonne Nelson, Glen Pederson, Marten Stoffel, *Dan Zazelenchuk.*

44. LAC LA PLONGE. *Katherine Brewster*, John Conkin, Patricia Shaw.

45. LA RONGE. Sid Robinson, *John Schisler,* Jan Shewchuk, Karen Waters.

46. LEADER NORTH. *Daisy Myers.*

47. LOVE - TORCH RIVER. Theresa Belliveau, Hal Birkett, Joan Birkett, Carol Blenkin, *Bert Dalziel,* Joan Dalziel, Kari Dalziel, Nora Dalziel, Sara Dalziel, Lena Dewar, Scott Edwards, Dave Epp, June Epp, Ashley Gallon, Elaine Inskster, Roseanne Kirkpatrick, Ron Knutson, Terry Knutson, Eilene L'Heureux, Meghan LeCuyer, Lynn Matthews, Bev Macauley, Dave Macauley, Lillian Nesset, Leonard Turtle.

48. LUSELAND. Estelle Finley, *Kim Finley*, Liam Finley.

49. MACDOWALL. Hazel Barton, Myron Barton, Val Borgeson, Dianne Brown, Barb Sather, *Alan Smith,* Ione Surbey.

50. MEADOW LAKE. *Bob Wilson*, Ian Wilson.

51. MOOSE JAW. Ryan

Dudragne, Jeff Mander, Karen Mander, *Alan Smith.*

52. MOOSE MOUNTAIN. Bob Cameron, Kathy Hedegard, Doyle Thomas, *Val Thomas.*

53. MORSE. Gordon Clark, Melanie Clark, Elizabeth Enns, Jon Enns, Noel Enns, Stella Enns, Mike Francis, Randy McCulloch, Joel Priebe, Ken Priebe, *Myrna Priebe,* Lori Wilson.

54. NIPAWIN. *Carol Blenkin*, Nancy Budd, Vi Budd, Joyce Christiansen, Bert Dalziel, Joan Dalziel, Rick Douslin, Patti Gaertner, Shannon Just, Jennette LeCuyer, Maghan LeCuyer, Jordan Lidster, Peter McCleary, Fred Olfert, Doug Phillips, Shirley Phillips, Ruth Thrasher.

55. NISBET FOREST, NORTHWEST.
Sandra Jewell.

56. NISBET FOREST, WEST. *Kim Clark,* Shamara Clark, Suzanne Clark, Guy Levesque, Patti Levesque.

57. OUTLOOK. *Alan Smith,* Graham Thomson.

58. PIERCE LAKE. Doug Davidson, *Ted Hindmarch,* Phil Shore.

59. PIKE LAKE. Alison Baudru, Adelle Bittner, Matthew Bittner, Janice Blackwell, Carol Blenkin, Alex Bond, Donna Bruce, Dave Cook, Louise Cook, Yvonne Cuttle, Elsbeth Dormuth, Lorne Duczek, Raea Gooding, Alice Hiller, Kodi Hiller, Haga May, Greg Hutchings, Ron Jensen, Robert Johanson, Audrey MacKenzie, Bill MacKenzie, Bob McNaughton, Nicole Michel, *Murray Morgan,* Keith Pahl, John Patterson, Frank Roy, Mark Sabourin, *Beverly Schmidt,* Jan Shadick, Stan Shadick, Phil Taylor, Guy Wapple, Michael Williams, Beverly Will, Diane Young, Dwight Young, Matthew Young, Nancy Young.

60. PRINCE ALBERT. Steve Abbott, Jim Bahr, Doug Braaten, Marie Braaten, Kim Clark, Shamara Clark, *Carman Dodge*, Andrea Fisher, Harold Fisher, Shelly Fisher, Hamilton Greenwood, Ron Jensen, Sandra Jewel, Gwen Klebek, Justine Lofstrom, Aspen McGuire, Collin McGuire, Sonnet McGuire, Christine Rye, John Rye, Phil Taylor, Don Weidl.

61. QU'APPELLE. Jean Ashcroft, Peter Ashcroft, Melanie Beattie, *Christine Blair*, Lillian Longpre, Colette Strushnoff,

Richard Strushnoff, Frank Veresh.

62. QU'APPELLE VALLEY DAM. Robert Johanson, Nick Saunders, Jan Shadick, Stan Shadick, Marten Stoffel, Guy Wapple, *Michael Williams*.

63. RAYMORE. *Valeriana Harris*, Sheila Lamont.

64. REGINA. Lionel Bonneville, Stephane Bonneville, Robert Cox, Ruth Englund, Jill Fosterer, Shirley Friel, Chris Harris, Mark Harrison, Norm Henderson, Trevor Herriot, Phyllis Isley, Laurie Koepke, Fran Krebs, Rheal Laroche, Maureen Lee, Bob Luterbach, Lauren Mang, Kim Mann, Val Mann, Vandy Nicolson, Wayne Pepper, *Brett Quiring*, Chris Ratch, Tom Riffel, Joanne Shurvin-Martin, Frank Switzer.

65. ROKEBY. Dennis Denesowich, Blake Harris, Lloyd Liebracht, Morley Maier, Lorne Niebergal, Fred Phillips, *Martin Phillips*, Kirk Screpnek, Ray Thies.

66. ROSCOMMON S.D. Bernice Althouse, Kate Althouse, Marjorie Finnie, Ruby Finnie, Brian Irving, Joan Lillibo, *Dianne Sloan,* Graham Sloan, Marguerite Sloan.

67. ROULEAU. Yvonne Bean, Allen McGratten, Noreen McGratten, *Patricia Sterzuk,* Irvine Warren.

68. ROUND LAKE (Prince Albert Area) *Crystal Frenette*.

69. ROUND LAKE (Qu'Appelle Valley). Joe Jacobs, Mona Jacobs, *Boyd Metzler*, Mary Ward, Pat Ward.

70. SALTCOATS. *Arden Bradford,* Donna Bradford, Len Cameron, Murial Cameron, Walter Farquahson, Dave Herron, Jim Jowsey, Shirley Jowsey, Gerri Knudsen, Ron Knudsen, Fern Mckay, Randy Torrie, Verne Truwell, Joan Wilson, Rob Wilson.

71. SASKATCHEWAN LANDING PROVINCIAL PARK. Marten Stoffel, *Dan Zazelenchuk.*

72. SASKATCHEWAN RIVER FORKS. Carman Dodge, *Don Weidl.*

73. SASKATOON. Allison Baudru, Neva Bayliss, Aricia Benvenuto, Jim Beveridge, Janny Bos, Kelly Brandson, Annemarie Buchmann-Gerber, Heinz Buchmann, Pete Christensen, George Christensen, Jacquie Christensen, Dave Cook, Louise Cook, Ewen Coxworth,

Gofdon Crockford, Yvonne Cuttle, Ron Delver, Keith Dodge, Lorne Duczek, Marlene Dzus, Melanie Elliott, Kathy Exner, Joan Feather, Lesley Fell, Bob Ferguson, Joanne Ferguson, David Forbes, Nettie Friesen, Cathy Fry, Joe Fry, Daniel Giesbrecht, Heather Giroux, Kyron Giroux, Bob Green, Mike Gollop, May Haga, Audrey Hall, John Hanbidge, Marlene Hanbidge, Peter Hardie, Kathy Holtslander, Ron Jensen, Arlene Karpan, Richard Kerbes, Gordon Koshinsky, Margaret Koshinsky, Audrey MacKenzie, Bill MacKenzie, Bob McNaughton, Priscilla Mah, Valerie Martz, Colleen Meldrum, Larry Mitchell, Scott Mitchell, Hilda Noton, John Patterson, Asha Perera, Allison Philips, Dorothy Riemer, Marella Rosta, Mary Jean Roy, Marc Sabourin, Andy Salisbury, Craig Salisbury, Lorriene Salisbury, Trish Santo, Scott Saretzky, Nick Saunders, Margie Scharf, Murray Scharf, Doug Schmeiser, Irene Schmeiser, Terry Schoonbaert, Laurie Slinger, Jan Solem, Marten Stoffel, Margot Taylor, Phil Taylor, Mary Toews, Dave Tyler, Mary Tyler, Hilda Voth, Heather Wagg, Guy Wapple, George West, *Michael Williams,* Sharon Wiseman, Amy Wobeser, Gary Wobeser, Jim Wood, Sandy Woynarski, Stan Woynarski, Norman Zlotkin.

74. SAWYER LAKE. Maureen Blight, Kathleen Pitt, Michael Pitt, *David Weiman.*

75. SHAMROCK. *Hugh Henry*, Randel McCulloch, Ryan McCulloch, Iris McNeill, Joel Priebe, Myrna Priebe, Lori Wilson.

76. SNOWDEN. Dale Debbler, Sonja Fidyk, Gus Fomradas, Don Friesen, *Irene Hagel*, Lillian Kuzniar, James Long, Doreen Long. Nadine Palidwar, Linda Patton, George Pickett, Karen Priestley, Valerie Rein, Jodi Rudd, Tim Thompson, Les White.

77. SPINNEY HILL. *Ed Driver,* Gerry Threlfall.

78. SQUAW RAPIDS. Bert Dalziel, Richard Douslin, *Ryan Dudragne*, Dan Sawatzky.

7*9. SWIFT C*URRENT. Jacquie Bolton, Jack Bloye, Lorraine Bloye, Eunice Cammell, Norris Currie, Terry Desharnais, Laurent Dudragne, Mary Ann Dudragne, Arnie Ens, Dave Green, Esther Green, Katie Hagman, Norma Hain, Leonard Head*, Hugh Henry,* Sarah Houghtaling, Leonard Howes, Lois Howes, Stephanie Kaduck, Connie Lendrum, Dot Letkeman, Maxine Lundman, Rita McLauchlan, Frances Moen, Janet Payne, Irene Stinson, Laura Sutter, Sharlane Toole, Kae Waters.

80. TOGO. Betty Burback, Del Burback, Kevin Chutskoff, Kim Chutskoff, Donna Dewores, Barb Elsasser, *Doug Elsasser,* Amanda Harper, Anita Huziak, Ed King, Louise King, William Koreliuk, Karen Leis, Clarence Pfeifer, Lucille Rezansoff, Phil Rezansoff, Zoria Woodworth, Claudia Zengl, Konrad Zengl.

81. WEYBURN. Cecil Burr, Bob Cameron, John Ferrier, Glen Fleming, Millie Fleming, Dale Huff, Sandi Huff, Elma McCormick, Don Payak, Doyle Thomas, Tanis Thomas, *Val Thomas*, Kim Thorson, Myrt Thorson, Dorothy Whitell, John Whitell.

82. WHITE BEAR. Sig Jordheim, Greg Nelson, Yvonne Nelson, *Dan Zazelenchuk.*

83. WHITEWOOD. Ken Aldous, Carole Armstrong, Cindy Ashfield, Joe Ashfield, Paul Ashfield, Grant Erickson, Joyce Kydd, Florence Luhtala, *Boyd Metzler,* Harry Mitchell, Marilyn Mitchell, Donna Mohr, Tony Saltasuk, Dawn Vennard, Lyle Vennard, Diane Veresh, Pat Ward.

84.WINGARD-FORT CARLTON. *Myron Barton,* Rebecca Beam, Mitch Forseille, Ruth Prosser, Carol Vaughn.

85. YORKTON. Lorna Bright, Vern Brown, Warren Crossman, Cheryl Fraser, Joyce Gardner, Bob Graham, Sheldon Knoll, Ethel Krekiewetz, Boyd Metzler, Kaarina Rahn, Gloria Rathgeber, Dorothy Riesz, Ray Riesz, Don Ruf, Bonnie Rushowick, *Geoff Rushowick*, James Rushowick, Gary Shury, Dorothy Skene, Stan Williams.

Table 1-1. Weather and Snow Cover.

Locality	Date	Minimum Temp (°C)	Maximum Temp (°C)	Minimum Wind (km/hr)	Maximum Wind (km/hr)	Minimum Snow (cm)	Maximum Snow (cm)	Sky A.M.	Sky P.M.
Archerwill	16 Dec 2013	-5	-3	25	25	5	5	clear	clear
Avonlea	3 Jan 2014	-6	-2	0	40	10	30	light snow	cloudy
Balgonie	4 Jan 2014	-27	-26	30	40	10	15	mostly clear	mostly clear
Bangor	20 Dec 2013	-32	-25	10	35	5	10	cloudy	overcast
Biggar	27 Dec 2013	-7	-1	0	40	10	30	partly cloudy	mod. fog
Birch Hills	30 Dec 2013	-34	-24	2	5	12	56	clear	clear
Borden-Radisson	17 Dec 2013	-17	-9	13	35	15	30	partly cloudy	partly cloudy
Broadview	26 Dec 2013	-9	-1	0	10	15	20	cloudy	partly cloudy
Cater	4 Jan 2014	-28	-24	5	20	35	50	mostly clear	cloudy
Chatsworth S.D.	4 Jan 2014	-30	-26	30	35	5	25	cloudy	clear
Clark's Crossing	14 Dec 2013	-25	-20	4	15	10	45	overcast	light snow
Coronach	22 Dec 2013	-22	-19	2	15	2	5	partly cloudy	mostly clear
Craven	14 Dec 2013	-21	-19			15	40	cloudy	cloudy
Creighton	21 Dec 2013	-41	-30	0	0	50	90	clear	clear
Crooked Lake	26 Dec 2013	-4	-1	5	15	20	40	overcast	mostly clear
Crooked River	31 Dec 2013	-40	-30	0	0	28	30	mostly clear	mostly clear
Cypress Hills P.P.	30 Dec 2013	-15	-15	0	10	15	60	light snow	overcast
Denholm	25 Dec 2013	-9	-7	0	5	20	30	mostly clear	cloudy
Eastend	17 Dec 2013	-8	-1	10	30	5	25	partly cloudy	mostly clear
Edenwold	28 Dec 2013	-27	-14	15	25			partly cloudy	overcast
Endeavour	1 Jan 2014	-40	-26	0	20	20	28	clear	clear
Estevan	1 Jan 2014	-22	-18	5	10	10	20	partly cloudy	partly cloudy
Estuary North	1 Jan 2014	-30	-20	20	30	60	90	overcast	overcast
Fenton	2 Jan 2014	-25	-16	40	60	20	25	overcast	overcast
Floral	24 Dec 2013	-9	-4	0	30	10	30	partly cloudy	light snow
Fort Qu'Appelle	22 Dec 2013	-30	-24	0	2			clear	clear
Gardiner Dam	16 Dec 2013	-9	-4	20	60	5	20	partly cloudy	mostly clear
Good Spirit Lake	4 Jan 2014	-27	-26	18	34	20	35	clear	clear
Grandora	3 Jan 2014	-26	-10	25	30				
Grasslands N.P.	17 Dec 2013	-15	3	2	5			clear	
Grayson	26 Dec 2013	-6	2	0	10	2	40	overcast	clear
Grenfell	29 Dec 2013	-34	-24	4	8	20	30	clear	partly cloudy
Harris	20 Dec 2013	-24	-21	10	15	10	30	overcast	overcast
Hazlet	26 Dec 2013	-2	5	10	25	5	25	mostly clear	mostly clear
Hudson Bay	29 Dec 2013	-30	-26	20	25	20	25		mostly clear
Indian Head	27 Dec 2013	-2	1	0	5	30	30	cloudy	cloudy
Kenaston	14 Dec 2013	-23		15	19		8	clear	clear
Kenosee Lake	2 Jan 2014	-31	-16	5	20	20	50	mostly clear	partly cloudy
Ketchen North	26 Dec 2013	-16	-5	0	5	25	30	overcast	cloudy
Kilwinnning	27 Dec 2013	-8	-12	12	35	20	40	light snow	heavy snow
Kindersley North	26 Dec 2013	-7	-4		4	13	15	clear	mostly clear
Kinloch	3 Jan 2014	-11	-9	2	5	30	38	overcast	overcast
Kyle	19 Dec 2013	-25	-20	0	20	0	30	clear	clear
Lac La Plonge	16 Dec 2013	-7	-5	10	10	15	40	clear	mostly clear
La Ronge	28 Dec 2013	-33	-31	20	35	60	60	clear	clear

Table 1-2. Weather and Snow Cover.

Locality		Minimum Temp (°C)	Maximum Temp (°C)	Minimum Wind (km/hr)	Maximum Wind (km/hr)	Minimum Snow (cm)	Maximum Snow (cm)	Sky A.M.	Sky P.M.
Leader North	26 Dec 2013	-10	2	0	0	5	40	clear	clear
Love-Torch River	26 Dec 2013	-18	-10	0	2	40	50	overcast	partly cloudy
Luseland	2 Jan 2014	-12	-5	10	40	12	27	partly cloudy	partly cloudy
Macdowall	29 Dec 2013	-37	-29	2	8		34	clear	clear
Meadow Lake	26 Dec 2013	-6	-4	2	5	30	60	clear	clear
Moose Jaw	15 Dec 2013	-14	-7	5	27	10	30	clear	clear
Moose Mountain	30 Dec 2013	-22	-17	10	12	10	14	cloudy	mostly clear
Morse	30 Dec 2013	-21	-20	19	29	30	80	overcast	overcast
Nipawin	28 Dec 2013	-28	-25	2	9	32	32	clear	clear
Nisbet Forest NW	30 Dec 2013	-36	-30	15	30		35	clear	clear
Nisbet Forest West	5 Jan 2014	-40	-30	20	20	30	40	clear	clear
Outlook	26 Dec 2013	-7	-5	11	28		14	clear	clear
Pierce Lake	15 Dec 2013	-13	0	2	40	25	35	mostly clear	partly cloudy
Pike Lake	4 Jan 2014	-28	-25	15	26	15	45	mostly clear	mostly clear
Prince Albert	15 Dec 2013	-16	-10	15	20	25	30	overcast	clear
Qu'Appelle	29 Dec 2013	-30	-21	2	11		45	clear	partly cloudy
Qu'Appelle Dam	15 Dec 2013	-14	3	4	20	20	30	mostly clear	partly cloudy
Raymore	4 Jan 2014	-38	-33	20	30	0	40	partly cloudy	partly cloudy
Regina	28 Dec 2013	-24	-19	10	0	6	20	cloudy	partly cloudy
Rokeby	3 Jan 2014	-18	-10	10	25	20	30	mostly clear	partly cloudy
Roscommon S.D.	26 Dec 2013	-11	-2	5	10	30	40	clear	clear
Rouleau	4 Jan 2014	-24	-25	2	29	16	20	mostly clear	light snow
Round Lake (PA)	2 Jan 2014	-29		10			30	overcast	
Round Lake (Q.V.)	16 Dec 2013	-6	-1	35	50	20	55	mostly clear	light snow
Saltcoats	28 Dec 2013	-30	-15		56		18		mostly clear
Sask. Landing P.P.	29 Dec 2013	-25	-14	5	30	10	40	partly cloudy	overcast
Sask. River Forks	14 Dec 2013	-28	-25	0	10	20	20	overcast	partly cloudy
Saskatoon	26 Dec 2013	-9	-2	12	28	15	30	clear	mostly clear
Sawyer Lake	1 Jan 2014	-34	-24	5	10	15	20	clear	clear
Shamrock	3 Jan 2014	-7	-7	35	55	14	28	light snow	mod. snow
Snowden	4 Jan 2014	-32	-25	20	39	27	41	clear	clear
Spinney Hill		-16	-10	0	35	15	40	partly cloudy	partly cloudy
Squaw Rapids	3 Jan 2014	-17	-10	10	35	25	60	light snow	cloudy
Swift Current	21 Dec 2013	-19	-19	5	25	12	20	light snow	mostly clear
Togo	5 Jan 2014	-35	-30	30	45	10	20	cloudy	
Weyburn	14 Dec 2013	-15	-19	5	8	10	15	cloudy	partly cloudy
White Bear	2 Jan 2014	-12	-5	5	30	10	60	overcast	mostly clear
Whitewood	28 Dec 2013	-23	-19	20	35	15	55	mod. Snow	partly cloudy
Wingard-Ft. Carlton	3 Jan 2014	-18	-9	20	30	25	40	partly cloudy	mostly clear
Yorkton	20 Dec 2013			6	11			partly cloudy	clear

Table 2-1. Effort and Habitat Coverage. Wild Fruit: p=poor, f=fair, g=good, e=excellent.

	Effort					Habitat Coverage (%)														
Locality	Participants	Km on foot	Hours on foot	Km by vehicle	Hours by vehicle	Hours at feeders	Evergreen forest	Mixedwood forest	Deciduous forest	Aspen grove/farmland	Aspen grove/prairie	Native prairie	Tame pasture	Farmland	Farmsteads	Urban	Open water	Riparian	Shield, bog,swamp	Wild Fruit Crop	
Archerwill	**13**	1.0	0.5	0	0.0	50.0		25						50	25						100
Avonlea	**2**	4.0	1.5	43	2.7	0.7							5	30	5	60					100
Balgonie	**4**	1.5	0.5	273	8.5	0.0				35	5			50	5	5				g	100
Bangor	**8**	0.0	0.0	70	10.0	11.0				30				10	60					f	100
Biggar	**7**	15.0	7.5	328	9.5	5.0				15				30	15	40				g	100
Birch Hills	**3**	0.0	0.0	123	8.3	2.0			5	60			5	15	5	10				g	100
Borden-Radisson	**8**	3.0	2.0	270	14.5	0.0								80		20				e	100
Broadview	**5**	3.0	1.0	141	7.0	5.0			20	35		5		25	5	10				p	100
Cater	**6**	0.0	0.0	253	6.8	4.5	5	10	5	15			5	50	5	5				f	100
Chatsworth S.D.	**6**	1.0	3.0	60	3.0	3.0				80		10			10					p	100
Clark's Crossing	**22**	37.0	20.1	545	28.4	3.0			1	21	2	3	2	10	19	35	1	6		g	100
Coronach	**2**	6.0	2.5	192	6.8	0.0						15	15	55	5	5	5			g	100
Craven	**20**	10.8	4.0	407	19.0	8.0				20		10		35	5	25	5			f	100
Creighton	**4**	9.0	4.0	155	10.0	2.5		40								40			20	g	100
Crooked Lake	**1**	1.0	0.8	146	5.0	0.0			25	15	10			10	10		30			p	100
Crooked River	**6**	0.0	0.0	24	2.0	12.0		40						40	20					f	100
Cypress Hills P.P.	**10**	8.0	5.0	15	1.0	0.0	40	40	8			10			2					g	100
Denholm	**4**	21.0	1.0	188	6.5	3.0				15			5	70	5	5				g	100
Eastend	**13**	10.0	2.5	200	5.0	0.0		5		20	50		5	5		15	<1			g	100
Edenwold	**1**	0.0	0.0	0	0.0	4.5										100				p	100
Endeavour	**1**	0.0	0.0	44	3.5	3.5								50	50					p	100
Estevan	**8**	17.0	8.5	258	9.5	2.0								4	2	37	8	49		g	100
Estuary North	**3**	0.5	1.0	15	2.0	6.0			25			25		25	25					g	100
Fenton	**1**	0.0	0.0	90	4.0	0.5				5				75	15	5				g	100
Floral	**2**	9.0	4.5	162	4.8	0.0				16				42	20	22				f	100
Fort Qu'Appelle	**16**	0.0	0.0	120	13.0	18.0				25	20		10	20	4	20	1			g	100
Gardiner Dam	**10**	30.0	15.0	476	18.3	1.0				2				50		8	40			f	100
Good Spirit Lake	**5**	0.0	0.0	107	6.0	8.0				90					5	5					100
Grandora	**1**	0.0	0.0	0	0.0	2.0									100						100
Grasslands N.P.	**12**	8.0	3.3	251	12.0	2.0						70	5	15	2	3		5			100
Grayson	**6**	11.0	3.0	120	4.0	3.0			20	30					20	25	5			f	100
Grenfell	**3**	0.5	0.5	132	5.5	3.0			15	15		5	15	25	10	15				p	100
Harris	**3**	13.0	6.0	170	4.3	0.0				12				33	20	35				f	100
Hazlet	**2**	2.0	1.0	238	5.8	0.0						10		80	5	5				p	100
Hudson Bay	**7**	0.0	0.0	20	1.0	16.0			30						50	10				f	90
Indian Head	**23**	4.0	4.5	282	10.0	31.0	5			9				75	5	5	1			p	100
Kenaston	**2**	2.0	1.0	223	4.0	1.0								85	5	10					100
Kenosee Lake	**2**	1.0	0.5	110	4.5	0.5			30	20						50				f	100
Ketchen North	**1**	1.0	1.5	50	2.5	5.5					30		20	20	20	10					100
Kilwinnning	**2**	2.0	0.5	115	7.5	0.0														p	
Kindersley North	**2**	0.0	0.0	98	4.5	0.0															
Kinloch	**5**	2.0	1.0	112	4.5	4.0	5	30	15	20					10	10				f	90
Kyle	**8**	16.0	4.0	350	11.0	4.0					5	5	5	35	35	10		5		p	100
Lac La Plonge	**3**	0.5	0.5	46	6.0	1.5	25	35	25							15				g	100

Table 2-2. Effort and Habitat Coverage. Wild Fruit: p=poor, f=fair, g=good, e=excellent.

Locality	Participants	Km on foot	Hours on foot	Km by vehicle	Hours by vehicle	Hours at feeders	Evergreen forest	Mixedwood forest	Deciduous forest	Aspen grove/farmland	Aspen grove/prairie	Native prairie	Tame pasture	Farmland	Farmsteads	Urban	Open water	Riparian	Shield, bog,swamp	Wild Fruit Crop	
Leader North	**1**	4.0	2.0	30	1.0	4.0					5	20		25	50					g	100
Love-Torch River	**25**	2.0	2.0	250	10.5	39.0	10	10		60					10	10				f	100
Luseland	**3**	4.0	2.0	211	5.0	0.0				60	10		10	10		10				g	100
Macdowall	**7**	0.0	0.0	45	1.3	7.0				40					60					p	100
Meadow Lake	**2**	5.0	4.0	121	4.0	0.0		50						30		20				p	100
Moose Jaw	**4**	5.0	2.0	110	7.5	2.0			10					25		60	5			g	100
Moose Mountain	**4**	0.0	0.0	186	7.0	0.0		67				2		20	3	8				p	100
Morse	**12**	11.0	5.5	458	17.0	4.0							3	90	7					g	100
Nipawin	**17**	1.0	0.5	158	8.3	18.0	10			90										g	100
Nisbet Forest NW	**1**	0.0	0.0	0	0.0	3.0									100						100
Nisbet Forest West	**5**	0.0	0.0	75	5.0	8.0	5	20		10				60		5					100
Outlook	**2**	5.0	3.0	100	3.5	0.5			15		5		5	15		60				g	100
Pierce Lake	**3**	0.0	0.0	90	4.8	0.0		55		40						5				g	100
Pike Lake	**37**	22.5	15.5	494	24.5	0.0														p	
Prince Albert	**22**	30.9	9.1	531	26.8	1.0	10			5	5			15		65				f	100
Qu'Appelle	**8**	2	1.0	180	7.0	6.0				70	5		5	10	5	5				f	100
Qu'Appelle Dam	**7**	14.0	13.1	287	9.0	0.0			25	10	2	2	6	17	4	33	1			f	100
Raymore	**2**	0.5	0.5	184	7.5	1.0				35				30	10	25				f	100
Regina	**26**	31.5	13.0	691	22.0	12.0				10				35		55				g	100
Rokeby	**9**	0.0	0.0	80	5.0	7.0								95	5						100
Roscommon S.D.	**9**	0.5	1.0	101	3.5	25.0				30				60	10					p	100
Rouleau	**5**	0.0	0.0	237	6.5	2.0								80	10	10				p	100
Round Lake (PA)	**1**	0.0	0.0	0	0.0	3.0			100											f	100
Round Lake (Q.V.)	**5**	0.0	0.0	153	5.0	5.5			25	25				25	5		20			p	100
Saltcoats	**15**	2.0	3.0	60	3.0	10.0				90					10					f	100
Sask. Landing P.P.	**2**	3.0	1.5	175	6.0	0.0				5		10		30	25	5		25		f	100
Sask. River Forks	**2**	3.0	2.0	82	5.0	1.0	15	20	20	15			5	15	5		5			p	100
Saskatoon	**93**	71.7	51.1	826	49.7	116		1		10		1	1	10	12	57	4	4		g	100
Sawyer Lake	**4**	4	1.5	28	2.0	0.0	5	10		30				50	5					f	100
Shamrock	**7**	2.5	1.5	130	7.5	2.0								65	25	10					100
Snowden	**16**	5.0	2.5	0	0.0	24.0									60	40				p	100
Spinney Hill	**2**	2.0	0.5	152	6.0	0.0		10	30	20		5		35						g	100
Squaw Rapids	**4**	6.5	2.5	157	8.5	0.0		93						2			5			f	100
Swift Current	**29**	18.0	15.0	475	31.5	20.0								20	15	65				f	100
Togo	**19**	1.0	0.5	35	1.0	4.0	5	20	15	20	10	10	10	10						p	100
Weyburn	**18**	0.0	0.0	280	10.0	2.0	2	1		1	1	5	2	71	5	10	2			p	100
White Bear	**4**	2.0	1.0	216	7.0	0.0						15	5	50	30					f	100
Whitewood	**17**	2.5	2.0	281	12.0	41.5				10				10	10	70				p	100
Wingard-Ft. Carlton	**5**	0.0	0.0	91	5.0	15.0	15			10					75					f	100
Yorkton	**20**	5.0	1.0	138	9.0	11.0				50						50				g	100

Table 3-1. Species found on 5 or more counts; ( ) = seen during Count Period (CP).

Map Number	1	2	3	4	5	6	7	8	9	10	11
	Archerwill 16 Dec 2013	Avonlea 3 Jan 2014	Balgonie 4 Jan 2014	Bangor 20 Dec 2013	Biggar 27 Dec 2013	Birch Hills 30 Dec 2013	Borden - Radisson 17 Dec 2013	Broadview 26 Dec 2013	Cater 4 Jan 2014	Chatsworth S.D. 4 Jan 2014	Clark's Crossing 14 Dec 2013
Canada Goose											1
Mallard					1						
Common Goldeneye											
Gray Partridge			8	1			8	17			40
Ring-necked Pheasant											
Ruffed Grouse	6		1			4				2	
Sharp-tailed Grouse			5	4	30		4	4			96
Bald Eagle											2
Northern Goshawk					1						
Golden Eagle											
Rock Pigeon		20	103	12	105	53	77	27	(8)		158
Eurasian Collared-Dove		3			45		8				1
Great Horned Owl	(1)				2	1					4
Snowy Owl		(1)	1			(1)					5
Downy Woodpecker	6	1	3	8	6	5	2	5	5	5	18
Hairy Woodpecker	7	(1)		7	7	5	3	4	4	4	11
Northern Flicker					1		1				
Pileated Woodpecker											1
Merlin											1
Gyrfalcon											
Northern Shrike								1			1
Gray Jay	2										
Blue Jay	23	3			6	2	23	2	11	3	6
Black-billed Magpie	6	1	15	27	84	37	143	34	26	23	219
American Crow											
Common Raven	8	2	33	6	75	24	92	33	150	5	307
Horned Lark			2		12						
Black-capped Chickadee	32		75	54	33	48	28	26	44	23	209
Boreal Chickadee	2										
Red-breasted Nuthatch	8			1	1						1
White-breasted Nuthatch	4	1	1	3		1		3	8	5	2
Brown Creeper											
American Robin					2						35
European Starling		9									100
Bohemian Waxwing					351	216	213	(15)			110
Cedar Waxwing							2				3
Snow Bunting	(25)		35	114	20	1296	1005	280	141	37	1646
Dark-eyed Junco		7	1		3		16				
Rusty Blackbird											(3)
Common Grackle											
Pine Grosbeak	18						1		4		
Purple Finch											
House Finch					1		6	(2)			71
Common Redpoll											
Pine Siskin							(1)				
American Goldfinch			25			2					
Evening Grosbeak	86								20		
House Sparrow	(100)	380	165	123	326	88	449	236	48	56	1020
Total Birds Count Day	209	427	473	361	1114	1782	2081	672	461	163	4070
Total Birds only in CP	130	2	0	0	0	1	1	17	8	0	3
Total Species Count Day	14	10	15	13	23	14	18	13	11	10	28
Total Species only in CP	6	2	0	0	0	1	1	2	1	0	1

Table 3-2. Species found on 5 or more counts; ( ) = seen during Count Period (CP).

Map Number	12	13	14	15	16	17	18	19	20	21	22
	Coronach 22 Dec 2013	Craven 14 Dec 2013	Creighton 21 Dec 2013	Crooked Lake 26 Dec 2013	Crooked River 31 Dec 2013	Cypress Hills P.P. 30 Dec 2013	Denholm 25 Dec 2013	Eastend 17 Dec 2013	Edenwold 28 Dec 2013	Endeavour 1 Jan 2014	Estevan 1 Jan 2014
Canada Goose	1869										2608
Mallard	6060	1		13				12			475
Common Goldeneye	4							1			31
Gray Partridge	1						(18)				
Ring-necked Pheasant						3		24			105
Ruffed Grouse										4	
Sharp-tailed Grouse		17		2		3	1	28			30
Bald Eagle	1			1	(2)			5			2
Northern Goshawk				1							1
Golden Eagle		1						4			
Rock Pigeon	272	44	34	21		1	34	20			66
Eurasian Collared-Dove	97	4						15			62
Great Horned Owl	1	1						2			2
Snowy Owl	5										
Downy Woodpecker		9	2	4	2	1	4	3	5	1	7
Hairy Woodpecker		12	5	3	2		3	4	3	1	3
Northern Flicker		2						2			1
Pileated Woodpecker			1	1							
Merlin	1								1		
Gyrfalcon											
Northern Shrike	1	2						(1)			6
Gray Jay			13								
Blue Jay		61		4	12			7	5	4	1
Black-billed Magpie	8	102	18	9	6	34	75	102	1	(1)	16
American Crow		3									
Common Raven	1	33	164	32	7	4	31	5		4	8
Horned Lark	76	1				25	(1)			20	3
Black-capped Chickadee		131	19	61	38	48	11	24	9		46
Boreal Chickadee			8								
Red-breasted Nuthatch		2	1	1	(1)	23		10		4	4
White-breasted Nuthatch		12		4	2				1		7
Brown Creeper											
American Robin		19									3
European Starling	9	7					(15)			2	
Bohemian Waxwing			64			225	50	95			(12)
Cedar Waxwing		51							6		
Snow Bunting	26	423					94	1000		18	22
Dark-eyed Junco		9			1						3
Rusty Blackbird											
Common Grackle											
Pine Grosbeak			27		14					22	
Purple Finch		1							2		
House Finch		48						4			33
Common Redpoll			18					25	13		
Pine Siskin			2						4		(1)
American Goldfinch							6		26		
Evening Grosbeak			55		51					17	
House Sparrow	35	380		59			139	89	50		280
Total Birds Count Day	8479	1377	498	219	138	367	451	1484	126	97	3840
Total Birds only in CP	0	0	0	0	6	0	34	1	0	1	14
Total Species Count Day	21	27	18	17	12	10	13	24	13	11	32
Total Species only in CP	0	0	0	0	3	0	3	1	0	1	3

Table 3-3. Species found on 5 or more counts; ( ) = seen during Count Period (CP).

Map Number	23	24	25	26	27	28	29	30	31	32	33
	Estuary North 1 Jan 2014	Fenton 2 Jan 2014	Floral 24 Dec 2013	Fort Qu'appelle 22 Dec 2013	Gardiner Dam 16 Dec 2013	Good Spirit Lake 4 Jan 2014	Grandora 3 Jan 2014	Grasslands N.P. 17 Dec 2013	Grayson 26 Dec 2013	Grenfell 29 Dec 2013	Harris 20 Dec 2013
Canada Goose					85						
Mallard				66	6105				19		
Common Goldeneye				(2)	121				1		
Gray Partridge					20					16	11
Ring-necked Pheasant	6							38			
Ruffed Grouse				2		3					
Sharp-tailed Grouse	13				36			277		25	21
Bald Eagle				(1)	26				2		
Northern Goshawk									(1)		
Golden Eagle	1				1			4			
Rock Pigeon	33		258	3	74	3		1	60	18	61
Eurasian Collared-Dove				8				2			17
Great Horned Owl			3	1	6			2			3
Snowy Owl	1				1						1
Downy Woodpecker			3	23	5	6	1		3	1	2
Hairy Woodpecker			3	15	3	4	1		2	2	3
Northern Flicker	2		1	(1)	1						
Pileated Woodpecker									1		
Merlin				(1)				2			1
Gyrfalcon					1						
Northern Shrike						(1)		1	2		1
Gray Jay				(1)							
Blue Jay	18	4	4	25	15	7		3	4	(1)	2
Black-billed Magpie	17	52	81	103	106	11	4	44	52	20	174
American Crow				1							
Common Raven	2	15	19	84	29	15	2		20	21	52
Horned Lark	8				3			1		8	
Black-capped Chickadee	8		61	187	41	47	8		38	4	25
Boreal Chickadee											
Red-breasted Nuthatch				4		1					
White-breasted Nuthatch				32		5			1	1	3
Brown Creeper											
American Robin					1						
European Starling	46		3		70			2	8		
Bohemian Waxwing	100		15	22	171					5	38
Cedar Waxwing											
Snow Bunting	525	60	479	(35)	443	201		215	215	75	593
Dark-eyed Junco				13						1	
Rusty Blackbird											
Common Grackle				(1)							
Pine Grosbeak											
Purple Finch											
House Finch				16	1			1			
Common Redpoll								2			
Pine Siskin											
American Goldfinch				8				2			
Evening Grosbeak											
House Sparrow	125	38	411	288	930	40	14	24	34	256	258
Total Birds Count Day	905	169	1342	905	8362	343	30	626	464	454	1266
Total Birds only in CP	0	0	0	44	0	1	0	0	1	1	0
Total Species Count Day	15	5	14	21	38	12	6	20	17	15	18
Total Species only in CP	0	0	0	9	0	1	0	0	1	1	0

Table 3-4. Species found on 5 or more counts; ( ) = seen during Count Period (CP).

Map Number	34	35	36	37	38	39	40	41	42	43	44
	Hazlet 26 Dec 2013	Hudson Bay 29 Dec 2013	Indian Head 27 Dec 2013	Kenaston 14 Dec 2013	Kenosee Lake 2 Jan 2014	Ketchen 26 Dec 2013	Kilwinning 27 Dec 2013	Kindersley North 26 Dec 2013	Kinloch 3 Jan 2014	Kyle 19 Dec 2013	Lac La Plonge 16 Dec 2013
Canada Goose											
Mallard			15								
Common Goldeneye											
Gray Partridge	29		10					18		124	
Ring-necked Pheasant											
Ruffed Grouse		3	3			17	3		3		1
Sharp-tailed Grouse	10		7							83	
Bald Eagle			11			1		2			
Northern Goshawk									1		
Golden Eagle					1						
Rock Pigeon	41		63	96		5	12	22		104	
Eurasian Collared-Dove			9							30	
Great Horned Owl	4		2	1				1		10	
Snowy Owl	1		6	1				1		12	
Downy Woodpecker		7	26		5	(1)	2		3	3	1
Hairy Woodpecker		9	23	1	8	3	3		3		1
Northern Flicker							1			1	
Pileated Woodpecker		(2)			1				(1)		
Merlin											
Gyrfalcon											
Northern Shrike						1					
Gray Jay		2					5		2		5
Blue Jay	1	32	47		15	6	7		15	4	4
Black-billed Magpie	37	9	88	38	20	22	34	23	17	139	11
American Crow											
Common Raven		133	64	4	29	13	71	2	31	15	39
Horned Lark	10						1			5	
Black-capped Chickadee	1	64	153		110	17	57		37	4	3
Boreal Chickadee		2					8				(1)
Red-breasted Nuthatch			6				2			(1)	
White-breasted Nuthatch		11	20		12	2	1		4	1	
Brown Creeper					3						
American Robin		1	1							1	
European Starling	5		21							4	
Bohemian Waxwing			8					(20)		12	
Cedar Waxwing											
Snow Bunting	1807	420	44	9	5	200	103	150	34	90	
Dark-eyed Junco			17							5	
Rusty Blackbird										9	
Common Grackle										2	
Pine Grosbeak		26				16	25		8		10
Purple Finch					6						
House Finch			25							24	
Common Redpoll			14	(46)			7			10	
Pine Siskin											
American Goldfinch			(9)		1						
Evening Grosbeak		152				(2)	103		6		8
House Sparrow	156	11	327	75		46	101	50		1119	
Total Birds Count Day	2102	883	1012	225	216	349	551	269	165	1813	83
Total Birds only in CP	0	2	9	46	0	3	0	20	1	2	1
Total Species Count Day	12	16	27	8	13	13	21	9	14	25	10
Total Species only in CP	0	1	1	1	0	2	0	1	1	2	1

Table 3-5. Species found on 5 or more counts; ( ) = seen during Count Period (CP).

Map Number	45	46	47	48	49	50	51	52	53	54	55
	La Ronge 28 Dec 2013	Leader North 26 Dec 2013	Love-Torch River 26 Dec 2013	Luseland 2 Jan 2014	Macdowall 29 Dec 2013	Meadow Lake 26 Dec 2013	Moose Jaw 15 Dec 2013	Moose Mtn P.P. 30 Dec 2013	Morse 30 Dec 2013	Nipawin 28 Dec 2013	Nisbet Forest Northwest 30 Jan 2014
Canada Goose							4				
Mallard							57				
Common Goldeneye											
Gray Partridge		12	2	7					78	9	
Ring-necked Pheasant		22							(4)		
Ruffed Grouse			8		3					1	
Sharp-tailed Grouse		6	(1)		(4)		31	1	108		
Bald Eagle			1						(1)		
Northern Goshawk			(2)								
Golden Eagle		1									
Rock Pigeon			50	19		6	772	1	10		
Eurasian Collared-Dove				33			9		5		
Great Horned Owl									16		
Snowy Owl		2		2			7	1	14		
Downy Woodpecker	3		15	1	6		4	6	1	8	2
Hairy Woodpecker	(2)	1	14		5		3	2		6	2
Northern Flicker							3				
Pileated Woodpecker	(1)		(1)							(1)	
Merlin									(1)		
Gyrfalcon									1		
Northern Shrike			(1)						1		
Gray Jay	1		10							3	
Blue Jay	(1)	7	26	1	1		4	5	2	13	
Black-billed Magpie	2	13	144	56	10	13	34	55	75	58	(2)
American Crow											
Common Raven	67	2	152	4	16	41	6	98	15	400	1
Horned Lark									26		
Black-capped Chickadee	13	2	142		54	4	17	51		53	20
Boreal Chickadee	(1)		4								
Red-breasted Nuthatch	(2)		11				3			9	
White-breasted Nuthatch			11		7		2	3	1		2
Brown Creeper											
American Robin											
European Starling		3	70				57		16	22	
Bohemian Waxwing	5	20	66		43	104	10		(12)	760	
Cedar Waxwing											
Snow Bunting			526	75	20				686	7	(1)
Dark-eyed Junco							4				
Rusty Blackbird											
Common Grackle		1									
Pine Grosbeak	18		125		(1)					54	
Purple Finch									1		
House Finch							8		4		
Common Redpoll									1	2	
Pine Siskin	(1)		3								
American Goldfinch					12			4			
Evening Grosbeak	30		294		2					109	
House Sparrow		20	24	80		2	132	25	1620	23	
Total Birds Count Day	139	113	1702	278	179	170	1170	252	2683	1537	27
Total Birds only in CP	8	0	6	0	6	0	0	0	18	1	3
Total Species Count Day	8	15	23	10	12	6	22	12	21	17	5
Total Species only in CP	6	0	5	0	3	0	0	0	4	1	2

Table 3-6. Species found on 5 or more counts; ( ) = seen during Count Period (CP).

Map Number	56	57	58	59	60	61	62	63	64	65	66
	Nisbet Forest W 15 Jan 2014	Outlook 26 Dec 2013	Pierce Lake 15 Dec 2013	Pike Lake 4 Jan 2014	Prince Albert 15 Dec 2013	Qu'appelle 29 Dec 2013	Qu'appelle Dam 15 Dec 2013	Raymore 5 Jan 2014	Regina 28 Dec 2013	Rokeby 3 Jan 2014	Roscommon 26 Dec 2013
Canada Goose											
Mallard			22						12		
Common Goldeneye			66		2						
Gray Partridge				36			2		104	30	
Ring-necked Pheasant									1		
Ruffed Grouse					3	(8)		1			13
Sharp-tailed Grouse		16	2	95		3	113			19	
Bald Eagle				1			4				
Northern Goshawk				1	(1)						
Golden Eagle											
Rock Pigeon		75		118	125	8	55	1	1084	28	3
Eurasian Collared-Dove		12					21		17		
Great Horned Owl				3			2	1	2	2	
Snowy Owl				2					27		
Downy Woodpecker	4		1	40	9	8	1	3	18	14	7
Hairy Woodpecker	6		4	34	16	11	8	2	(1)	13	10
Northern Flicker				(1)	1		4		3		
Pileated Woodpecker				2							
Merlin									2	1	
Gyrfalcon								1	(1)		
Northern Shrike					1			1	1		
Gray Jay	(1)				4						
Blue Jay	17	11	4	27	19	1	25		4	2	7
Black-billed Magpie	7	26	12	219	178	42	137	27	31	46	36
American Crow									1		
Common Raven	9	11	29	98	313	30	19	83	103	50	15
Horned Lark								2			
Black-capped Chickadee	42	7	16	522	238	43	26	32	46	71	73
Boreal Chickadee					4						
Red-breasted Nuthatch	1	1	1	6	8			1	12		
White-breasted Nuthatch	4	1		15	5	3		1	4	2	1
Brown Creeper							1		(1)		
American Robin		1		47			5		1		
European Starling							79		15		
Bohemian Waxwing	(50)	100		664	1671		317	120	27	160	25
Cedar Waxwing				26							
Snow Bunting	107	(20)	186	510	792	46	108	355	1	73	314
Dark-eyed Junco					2				27	10	13
Rusty Blackbird											
Common Grackle									2		
Pine Grosbeak	7		2	8	19						
Purple Finch											
House Finch							6		80		
Common Redpoll											
Pine Siskin					12				1		
American Goldfinch	11				2	1					
Evening Grosbeak	70			1	67						
House Sparrow		118		405	412	15	551	296	1072	180	54
Total Birds Count Day	286	381	345	2882	3923	312	1484	927	2699	701	571
Total Birds only in CP	51	20	0	1	2	8	0	0	6	0	0
Total Species Count Day	13	14	12	25	26	14	20	16	28	16	13
Total Species only in CP	2	1	0	1	2	1	0	0	5	0	0

Table 3-7. Species found on 5 or more counts; ( ) = seen during Count Period (CP).

Map Number	67	68	69	70	71	72	73	74	75	76	77
	Rouleau 4 Jan 2014	Round Lake (P.A) 2 Jan 2014	Round Lake (Q.V.) 16 Dec 2013	Saltcoats 28 Dec 2013	Sask. Ldg. P.P. 29 Dec 2013	Sask. River Forks 14 Dec 2013	Saskatoon 26 Dec 2013	Sawyer Lake 1 Jan 2014	Shamrock 3 Jan 2014	Snowden 4 Jan 2014	Spinney Hill 17 Dec 2013
Canada Goose											
Mallard			8				169				
Common Goldeneye			2				160				
Gray Partridge					41				21	4	
Ring-necked Pheasant											
Ruffed Grouse						1		(6)		5	
Sharp-tailed Grouse	10				106		28		1		3
Bald Eagle			1		1		(1)				1
Northern Goshawk							2				1
Golden Eagle					1						
Rock Pigeon	7		10	18	19		1962		2		
Eurasian Collared-Dove				14			10				
Great Horned Owl	3			1	4		3		1		1
Snowy Owl	20				1				1		
Downy Woodpecker	(1)	2	6	15		3	50		1	13	2
Hairy Woodpecker			1	14		6	18	1		12	1
Northern Flicker							22				
Pileated Woodpecker						1		1			
Merlin					(1)		6				
Gyrfalcon							1				
Northern Shrike							2				1
Gray Jay								(5)		10	
Blue Jay		2	11	14		6	170	1	(6)	28	11
Black-billed Magpie	2		13	16	55	30	567	11	12	66	96
American Crow	4						10				
Common Raven	2		13	38	2	11	431	10		99	20
Horned Lark					8				12		11
Black-capped Chickadee		8	79	51		21	942	13		114	23
Boreal Chickadee										1	
Red-breasted Nuthatch						1	103			4	1
White-breasted Nuthatch			5	10		1	16	2		4	
Brown Creeper			1								
American Robin					2		34				
European Starling	50				(10)		109			15	
Bohemian Waxwing					88		173				5
Cedar Waxwing				15			50				
Snow Bunting	15		3	215	3		396	344	293	60	67
Dark-eyed Junco	1		1				9	1			
Rusty Blackbird											1
Common Grackle							(1)				
Pine Grosbeak					3		5	21		17	
Purple Finch							1				
House Finch							480				
Common Redpoll	6		10				5			2	5
Pine Siskin				2							
American Goldfinch		(4)		2		3	9	(6)			
Evening Grosbeak		2				55		30		174	
House Sparrow	121		1	175	331	17	2778	41	270	128	50
Total Birds Count Day	241	14	165	600	666	161	8750	476	614	756	300
Total Birds only in CP	1	4	0	0	13	0	2	18	6	0	0
Total Species Count Day	12	4	16	15	16	14	40	12	10	18	18
Total Species only in CP	1	1	0	0	3	0	2	4	1	0	0

Table 3-8. Species found on 5 or more counts; ( ) = seen during Count Period (CP).

Map Number	78	79	80	81	82	83	84	85				
	Squaw Rapids 3 Jan 2014	Swift Current 21 Dec 2013	Togo 5 Jan 2014	Weyburn 14 Dec 2013	White Bear 2 Jan 2014	Whitewood 28 Dec 2013	Wingard-Ft Carlton 29 Dec 2013	Yorkton 20 Dec 2013	Totals Count Day	Totals only in Count Period	#Counts count day	# Counts only in count period
Canada Goose									4567	0	5	0
Mallard								2	13037	0	16	0
Common Goldeneye	117								505	2	10	1
Gray Partridge		79	15	86	78	(1)			907	19	29	2
Ring-necked Pheasant		9		7	10				225	4	10	1
Ruffed Grouse	1		3			1	1		93	14	25	2
Sharp-tailed Grouse	29	2	9	206	42	4	5		1535	5	42	2
Bald Eagle	3		(1)						65	6	17	5
Northern Goshawk		1							9	5	8	4
Golden Eagle					(1)				14	1	8	1
Rock Pigeon		309		154	123	182		79	7121	8	58	1
Eurasian Collared-Dove		75		45		10		6	558	0	25	0
Great Horned Owl		2		4	2	(1)			93	2	32	2
Snowy Owl		5		7	6				130	2	24	2
Downy Woodpecker		2	10	1		28	5	16	498	2	69	2
Hairy Woodpecker			21			21	7	12	423	4	61	3
Northern Flicker		(1)							46	3	15	3
Pileated Woodpecker	2								11	6	9	5
Merlin		3	(1)						18	4	9	4
Gyrfalcon									4	1	4	1
Northern Shrike			(1)	1					24	4	16	4
Gray Jay	3								60	7	12	3
Blue Jay	4	(2)	53			20	10	6	898	10	65	4
Black-billed Magpie	26	164	6	45	137	32	14	48	4649	3	82	2
American Crow				6					25	0	6	0
Common Raven	58	2	58	3	3	25	42	411	4474	0	80	0
Horned Lark				1	1				236	1	21	1
Black-capped Chickadee	18	10	162			234	35	168	5174	0	71	0
Boreal Chickadee	2		2						33	2	9	2
Red-breasted Nuthatch		11				4		7	253	4	32	3
White-breasted Nuthatch		5	14			16	4	12	298	0	52	0
Brown Creeper						1			6	1	4	1
American Robin		(1)				1		1	155	1	16	1
European Starling		8			11	1			742	25	26	2
Bohemian Waxwing					30			52	6135	109	36	5
Cedar Waxwing						5			158	0	8	0
Snow Bunting	97	220	165	10	317	414	65		18315	81	65	4
Dark-eyed Junco		1		53		3		5	206	0	24	0
Rusty Blackbird					1	(1)			11	4	3	2
Common Grackle				7					12	2	4	2
Pine Grosbeak	3		24				11	7	495	1	26	1
Purple Finch						2		10	23	0	7	0
House Finch		69		66					943	2	18	1
Common Redpoll		14		100		2			236	46	17	1
Pine Siskin		1							25	3	7	3
American Goldfinch				6		11		21	152	19	18	3
Evening Grosbeak	(2)		80				71		1483	4	22	2
House Sparrow		1050	187	265	476	326	59	240	19770	100	70	1
Total Birds Count Day	364	2046	810	1528	1238	1344	329	1103	95689	536		
Total Birds only in CP	2	4	3	0	1	3	0	0	536			
Total Species Count Day	14	23	16	24	15	23	13	18				
Total Species only in CP	1	3	3	0	1	3	0	0				

Table 4-1 Species found in fewer than 5 counts.

Species	Locality and Number (*=Count Period)
Cackling Goose	Estevan (4), Gardiner Dam (1)
Gadwall	Coronach (1)
Northern Pintail	Biggar (1), Estevan (1)
Green-winged Teal	Moose Jaw (1)
Canvasback	Gardiner Dam (2)
Redhead	Gardiner Dam (14)
Ring-necked Duck	Estevan (1*)
Greater Scaup	Gardiner Dam (9)
Lesser Scaup	Estevan (5), Fort Qu'Appelle (3), Gardiner Dam (10)
Long-tailed Duck	Squaw Rapids (1)
Barrow's Goldeneye	Fort Qu'Appelle (1*)
Hooded Merganser	Estevan (3)
Common Merganser	Crooked Lake (2), Fort Qu'Appelle (1), Gardiner Dam (13), Grayson (2)
Ruddy Duck	Estevan (1)
Greater Sage-Grouse	Grasslands N. P. (2)
Spruce Grouse	Cooked River (2), Love-Torch River (2)
Willow Ptarmigan	Creighton (51)
American White Pelican	Gardiner Dam (1)
Northern Harrier	Archerwill (1*), Gardiner Dam (1)
Sharp-shinned Hawk	Fort Qu'Appelle (1*), Regina (2*), Saskatoon (1)
Cooper's Hawk	Eastend (1)
Red-tailed Hawk	Clark's Crossing (1)
Rough-legged Hawk	Grasslands N. P. (2)
American Coot	Coronach (7), Estevan (1)
Herring Gull	Gardiner Dam (1)
Great Black-backed Gull	Gardiner Dam (1)
Mourning Dove	Floral (1), Kyle (2), Saskatchewan Landing (2*), Saskatoon (5)
Eastern Screech-Owl	Archerwill (1*)
Northern Hawk Owl	Love-Torch River (1*), MacDowall (1*), Saskatoon (1)
Great Gray Owl	Bangor (1), Crooked River (3*), Kinloch (1), Love-Torch river (2)
Short-eared Owl	Grasslands N. P. (1), Weyburn (1)
Northern Saw-whet Owl	Prince Albert (1*)
Red-bellied Woodpecker	Grenfell (1)
Yellow-bellied Sapsucker	Biggar (1)
American Three-toed Woodpecker	Creighton (1), Kilwinning (2), Sawyer Lake (1*)
Prairie Falcon	Coronach (1), Kyle (1*), Leader North (1), White Bear (1)
Golden-crowned Kinglet	Clark's Crossing (1), Crooked Lake (1), Gardiner Dam (1), Saskatoon (10)

Table 4-2. Species found in fewer than 5 counts.

Species	Locality and Number (*=Count Period)
Townsend's Solitaire	Regina (1*)
Varied Thrush	Gardiner Dam (1)
Lapland Longspur	Coronach (3), Qu'Appelle (100), Weyburn (448)
American Tree Sparrow	Archerwill (1), Eastend (2), Prince Albert (1), Swift Current (4)
Vesper Sparrow	Saskatchewan Landing (1)
Song Sparrow	Regina (1)
White-throated Sparrow	Denholm (1), Indian Head (1), Outlook (1), Saskatoon (3)
Harris's Sparrow	Pike Lake (1), Qu'Appelle (1)
White-crowned Sparrow	Cooked River (1)
Northern Cardinal	Craven (1), Nisbet Forest West (1), Prince Albert (1)
Red-winged Blackbird	Denholm (2), Gardiner Dam (12), Indian Head (1), Weyburn (1)
Brewer's Blackbird	Hudson Bay (1), Pike Lake (1), Weyburn (5), Whitewood (1)
Brown-headed Cowbird	Togo (1)
Cassin's Finch	Saskatoon (1)
Red Crossbill	Sasaktchewan River Forks (5), Saskatoon (7)
White-winged Crossbiill	Creighton (15), Kilwinning (3)

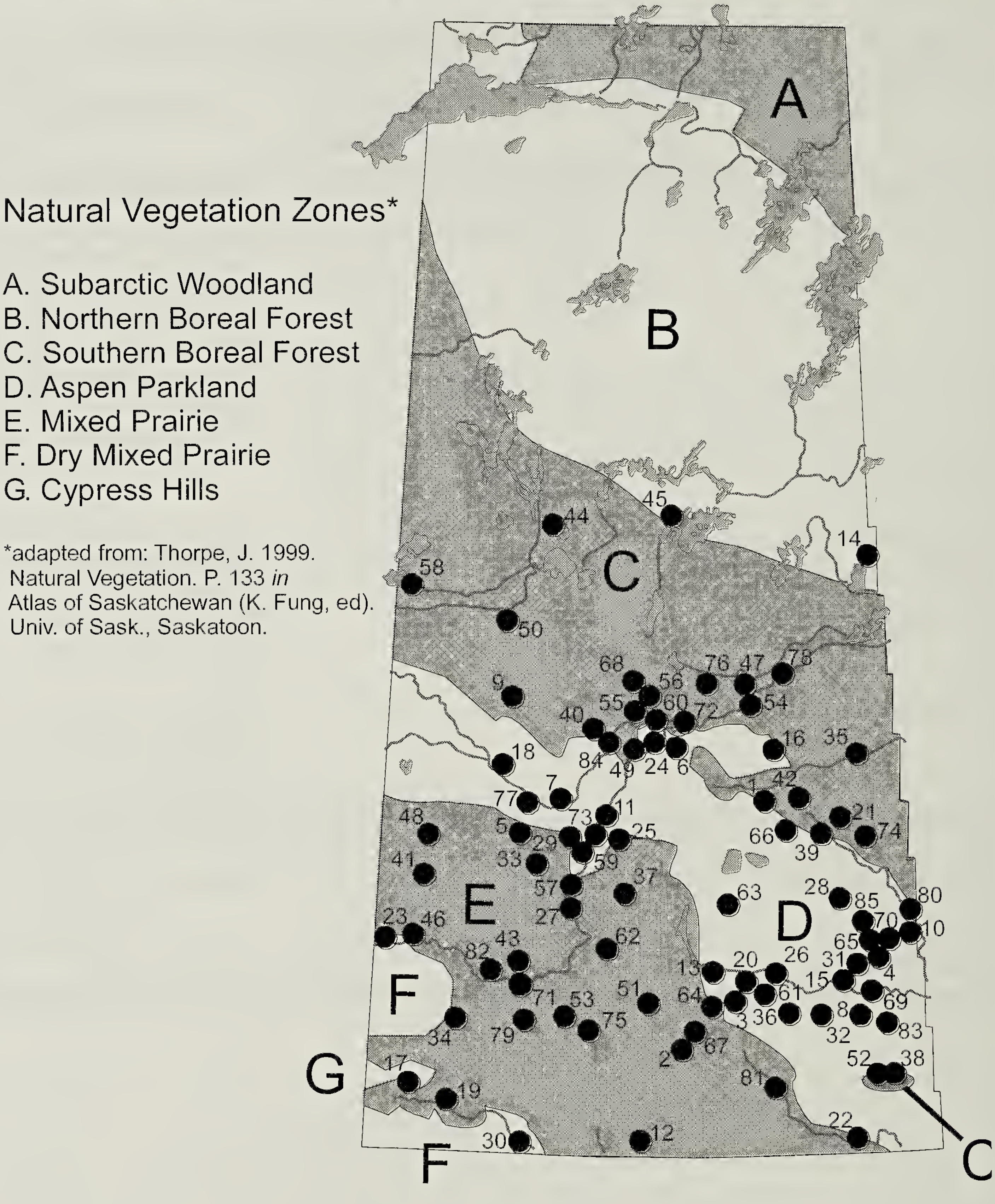
Table 5. Birds not identified to species.

Category	Locality and Number (*=Count Period)
Hawk sp.	Archerwill (1*)
Woodpecker sp.	Outlook (1), Saskatoon (1)
Blackbird sp.	Morse (2)
Crossbill sp.	Prince Albert (18)

Table 6. New (in bold and italics) and tying high counts for individual species 2013.

LOCATION	2013 COUNT	SPECIES	PREVIOUS HIGH	LOCATION, YEAR
Gardiner Dam	***9***	***Greater Scaup***	***5***	***Gardiner Dam, 1997***
Squaw Rapids	1	Long-tailed Duck	1	Fort Qu'Appelle, 1968 (count period); Saskatoon, 1997; Gardiner Dam, 2002; Squaw Rapids, 2011
Fort Qu'Appelle	1	Barrow's Goldeneye	1	Saskatoon, 2007 (count period); Squaw Rapids, 2012 (count period)
Gardiner Dam	***1***	***Great Black-backed Gull***	***NEW***	
Archerwill (count period)	1	Eastern Screech-Owl	1	Yorkton, 1985; Kamsack, 1989; Estevan, 1995; Somme 2007
Grenfell	1	Red-belled Woodpecker	1	Regina, 2001; Yorkton, 2007; Crooked River, 2010
Estevan	6	Northern Shrike	6	Saskatoon, 1963, 2007; Pike Lake, 1969, 2010; Fort Walsh, 1989, 1990, 1991, 1994
Saskatoon	***942***	***Black-capped Chickadee***	***920***	***Saskatoon, 2002***
Fort Qu'Appelle	***32***	***White-breasted Nuthatch***	***31***	***Whitewood, 2008***
Saskatoon	1	Cassin's Finch	1	Fort Walsh, 1983

Figure 1. Location of 2013 counts (numbers correspond to those in text under **Count areas and participants**).



Natural Vegetation Zones*

A. Subarctic Woodland
B. Northern Boreal Forest
C. Southern Boreal Forest
D. Aspen Parkland
E. Mixed Prairie
F. Dry Mixed Prairie
G. Cypress Hills

*adapted from: Thorpe, J. 1999. Natural Vegetation. P. 133 *in* Atlas of Saskatchewan (K. Fung, ed). Univ. of Sask., Saskatoon.

Table 7. Population changes in numbers of selected species in 2013* compared to 2012 and the average for 5 years (2008-2012, based on the number of birds per party hour. A minus sign indicates a decrease from previous years.

Species	% change from 2012	% change from 2008-2012		% change from 2012	% change from 2008-2012
Canada Goose	1510	-54	Common Raven	-2	6
Mallard	460	73	Horned Lark	-41	-91
Common Goldeneye	80	-15	Black-capped Chickadee	19	24
Gray Partridge	-22	-36	Boreal Chickadee	-30	-69
Ring-necked Pheasant	-35	-35	Red-breasted Nuthatch	-66	-50
Ruffed Grouse	16	2	White-breasted Nuthatch	19	27
Sharp-tailed Grouse	52	42	Brown Creeper	-75	-54
Bald Eagle	18	-10	American Robin	333	26
Northern Goshawk	-10	-27	European Starling	-28	-29
Golden Eagle	-7	-29	Bohemian Waxwing	-20	30
Eurasian Collared-Dove	4	-6	Cedar Waxwing	171	-3
Great Horned Owl	78	139	Snow Bunting	19	-22
Snowy Owl	13	-7	Dark-eyed Junco	4	94
Downy Woodpecker	-38	9	Pine Grosbeak	-87	-74
Hairy Woodpecker	2	20	House Finch	24	20
Northern Flicker	15	19	White-winged Crossbill	-98	-95
Pileated Woodpecker	-6	15	Common Redpoll	-99	-97
Merlin	-6	-49	Hoary Redpoll	-100	-100
Rock Pigeon	-13	5	Pine Siskin	-77	-94
Northern Shrike	31	22	American Goldfinch	1422	344
Gray Jay	-26	-33	Evening Grosbeak	31	21
Blue Jay	26	39	House Sparrow	21	11
Black-billed Magpie	10	26			

As tremendous changes can occur in small sample sizes only those species recorded on an annual average of six or more counts are included.

A HUNTER-NATURALIST'S OBSERVATIONS OF SHARP-TAILED GROUSE TRENDS IN SASKATCHEWAN

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Beginning in 2013, the Saskatchewan Ministry of Environment reduced the daily bag limit for Sharp-tailed Grouse *(Tympanuchus phasianellus)* from three to two.[1] With the original possession formula of twice a daily limit retained, the possession limit is then reduced from six to four. This reduction in allowable take by hunters follows a previous reduction from five to three in 1989.

The reduction in bag limits is a response to a long-term and continuing decline in Sharp-tailed Grouse numbers. Originally, Sharp-tailed Grouse (also called "sharptails") were common from the mid-western United States through Canada to Alaska. This included all four western Provinces where grassland or grassland edge was available, and parts of Ontario and Quebec. Sharptails are now relegated to pockets of grassland and shrub-steppe habitats where these habitats remain.[2] It appears that Sharp-tailed Grouse are quite tolerant of disturbance on dancing grounds[3,4] but appropriate nesting and brood-rearing cover nearby may be more critical.[5]

The Ministry's press release[1] invites hunters and naturalists to report their observations in a specially created section of the ministry's website. The release boldly states "Saskatchewan is moving forward in efforts to monitor its upland game populations." Is this "moving forward" anything more than calling on hunters and naturalists to report sharp-tail sightings? The press release acknowledges that "...there has been little research conducted..." and cites no data that would support the change in bag limits.

While the sharptail's decline is not in doubt and action is indeed needed, without direct data it may be difficult or impossible to address the complex pressures faced by grassland birds in Canada generally, including the Sharp-tailed Grouse. What may be more urgent than data is action to address the factors in the declines that are already known. The North American Bird Conservation Initiative Canada[6] states "Native grasslands and pasture lands continue to be lost or degraded through agricultural intensification, such as conversion to grains, oilseed or fibre crops which provide poor habitat for most birds. Oil and gas development, fragmentation by road and fire suppression also reduce habitat."

There is no insinuation in the Ministry's press release that the hunters' take is the cause of sharptail declines. Judging from the popular literature, hunters are secure in the thought that their craft is appropriately regulated[7] once market hunting had been banned; barring a recent resurgence of hunt farms and commercialized hunting.[8,9] The ecological essence informing appropriate regulation is that game animals compete with one another within a species for a maximal contribution of young to the future breeding population, creating a so-called 'surplus.' This surplus is harvested in an anticipated 'compensatory' manner in the fall, before winter mortality or lack of breeding habitat in spring[10] impose the final population limit. While the ecological principles underlying such hunting are well accepted, their administration still requires considerable care.[11]

In Saskatchewan, hunters point to winter severity as a major factor in game bird fluctuations, noting a dramatic decline among the introduced Gray Partridge *(Perdix perdix)* following two severe winters in 2011-12 and 2012-13. Although finding that sharptails' food intake could not always meet expected energy demand for parts of the winter in a study near Duperow, Saskatchewan, Schmidt[12] did not find excessive weight loss during those periods. This suggests that the native sharptails are well adapted to the normal range in severity of Saskatchewan winters under the habitat conditions studied. Hunters also point to the risk of extirpation for Greater Sage-Grouse *(Centrocercus urophasianus)*, a species that has never had a hunting season in Saskatchewan. In general, hunters believe in habitat management and support programs toward that end.[13,14]

Having hunted Sharp-tailed Grouse regularly for decades, I have observed declines primarily in small, isolated pockets of non-functional grassland remnants. Here, hunters report sharptails when winters are mild and, more importantly, when early summer rains are interspersed with dry periods. During the vulnerable time of early brood rearing, grouse chicks can get chilled and succumb when wet. Gray Partridge, like sharptail chicks, also require periods of dry weather. Insects need to be accessible to chicks in areas with vegetation structure where insects are within reach and where escape cover is always nearby. Unlike the introduced partridge, however, the native

Sharp-tailed Grouse appears to be less dependent on seeds revealed on the ground through scratching. Sharptails routinely feed in trees and shrubs above a deep layer of snow.[5,15]

Hunting Area and Methods

During the 2013 hunting season, I made systematic records while hunting. Responding to the Ministry's call for information, I recorded time afield, habitat where sharptails were found, and the age, sex and food items found in crops of the shot birds.

As in previous years, I hunted on the Purdue Ranching Co-op Association pasture approximately 15 km NW of Purdue, Saskatchewan. The Saskatchewan Crown owns the contiguous 29 km^2 of pastureland. Day-to-day management decisions, including the timing, duration and intensity of grazing, are made by the rancher-members of the co-operative in the style of the so-called 'co-op pastures.'

The native grass and shrub cover exists because the hilly and rocky glacial moraine (Photo 1) has proven difficult to cultivate. Non-random clusters of mid-size rocks, including teepee rings, indicate use by native peoples in the past. Buffalo rubbing stones suggest past use by bison. Fescue grasses are common at this prairie-parkland interface. Woody cover in draws on steep hillsides included Trembling Aspen *(Populus tremuloides),* Canada Buffaloberry *(Sheperdia canadensis),* Choke Cherry *(Prunus virginiana),* Rose (*Rosa* spp.), Snowberry (*Symphoricarpos* sp.), and Silverberry *(Elaeagnus commutata).* The latter two also covered some of the gentler slopes and low-lying areas. All combined, this vegetation no doubt provides important winter food for grouse.[2,12]

I recorded the time and habitat covered over 7 days of hunting, from 15 Sept. to 2 Nov. 2013. Each of 14 hunting forays lasted 35-170-min. in a loop that lead back to the vehicle for a break and to water the dogs. Each foray covered a new area of the pasture. Hunting took place from 1000 – 1600 H. Hunting time was short each day, because a limit of two grouse was obtained quickly. Some of my grouse-hunting friends hunted no sharptails in 2013, because they felt that driving to and fro would take longer than hunting itself under the reduced bag limit. I shot only grouse pointed by the dogs to heighten the experience and extend the time afield.

I used GPS to mark the locations of the parked vehicle, grouse flushed and grouse shot.

Photo 1. *A Large Munsterlander, "Buteo", is pointing a young Sharp-tailed Grouse in the moraine landscape of the Purdue Ranching Co-op Association pasture, near Purdue, Saskatchewan. The photo shows grassland on hilltops, slopes and low lying areas interspersed with native shrubs, and rare semi-permanent ponds. Photo by J.K. Schmutz, taken on 28 Sept. 2013.*

The gender of shot birds was determined by examining gonads internally. Age was based on the molt of outer primaries following G.W. Pepper in Connelly et al.[2] Grouse were plucked and gutted *in situ*, and gender, age and crop contents determined at home. I judged a fully extended and bulging crop to be full and partially filled crops in tenths of maximum crop volume.

The considerable number of grouse found was strongly influenced by my use of hunting dogs. On different occasions I followed 2-5 Large Munsterlander dogs, one of several breeds of mid-range versatile hunting dogs.[16] The dogs often searched 150 m to each side, depending on cover and terrain. While the use of dogs clearly leads to more grouse encountered and thus possibly greater hunting pressure, their use also ensured that virtually every grouse shot or crippled was also recovered and thus counted in the bag limit.

I calculated grouse densities

Table 1. *A summary of hunting effort and Sharp-tailed Grouse numbers and densities over seven days of hunting on the Purdue Co-op community pasture from 15 September to 2 November 2013 in Saskatchewan.*

Hunting foray #	Sharptails			Hrs spent	Approx. linear km	Km^2 covered	1st Flush Grouse/km^2	All Grouse/Hr
	All	1st flush	Bagged					
1	0	0	0	1.5	4.1	1.2	0.0	0.00
2	8	8	1	0.75	1.8	0.5	14.8	10.67
3	2	2	0	0.75	3.0	0.9	2.2	2.67
4	5	5	0	1	1.9	0.6	8.8	5.00
5	19	15	2	2.08	3.5	1.0	14.4	9.13
6	4	4	0	1.33	2.2	0.7	6.0	3.01
7	10	7	2	1.92	4.4	1.3	5.3	5.21
8	6	6	1	1.42	2.8	0.8	7.1	4.23
9	7	5	1	0.58	0.8	0.2	21.1	12.07
10	27	23	1	1.42	7.3	2.2	10.5	19.01
11	4	4	1	1.08	0.9	0.3	14.0	3.70
12	25	20	2	2.83	1.9	0.6	35.1	8.83
13	1	1	0	1.92	2.5	0.8	1.3	0.52
14	19	17	1	1.42	4.0	1.2	14.2	13.38
Total	137	117	12	20.00	41.2	12.4		
Average	9.79	8.36	0.86	1.43	2.9	0.9	9.5	6.96

per km^2 for each hunting foray using an estimate of linear distance walked and a coverage by the dogs of 300 m side-to-side. I estimated distance walked by plotting the parked vehicle, all grouse locations, all other plotted GPS locations of interest (e.g. buffalo rubbing stones) and trees, fences and trails visited. While my walking direction was influenced by promising cover, the pasture was so diverse and grouse found throughout, that all parts of the pasture seemed to have an equal chance of holding grouse.

Grouse Numbers

Sharp-tailed grouse were the most common species (Table 1) on the pasture. One Ruffed Grouse was spotted in 2013, and one was shot in 2012. In the 2013 hunting season, after two long winters with low temperatures and deep snow, Gray Partridge were rare. In other years, partridge occupied the pasture border where cereal crops were grown outside it. Whereas in previous years primarily Mule Deer (*Odocoileus hemionus*) but also White-tailed Deer (*O. virginianus*) were common in the woody cover of draws, I observed only one deer that the dogs had moved from cover in 2013. One deer carcass was located in a woodlot and the local ranchers noted many more. This deer mortality is indicative of the harshness of the winters, yet Sharp-tailed Grouse fared remarkably well. Sharp-tailed Grouse appeared numerous with 6.9 grouse seen on average per hunting hour, or 6.4 when subtracting presumed re-encounters of previously flushed grouse (Table 1). Although I kept no written record in previous years grouse numbers appeared stable or little changed in 2013.

The age and gender of shot birds were: two adult females, three juvenal females and three juvenal males. The gender of two adults and two juveniles was not determined. In his study near Asquith, Saskatchewan 1968-71, Pepper[5] found that adult males generally came to dancing grounds in fall also and tended to feed and rest in groups of males. The females and young moved separately from the males at this time.

My bag included at least one adult female that was removed from her brood of young. What influence such a removal has on the subsequent survival of her young is apparently unknown. Of five juvenals bagged in September, four were then growing their last primary feather for the year, #8, and one was also still growing primary #7. Thus, the replacement of primaries was nearly complete; primaries #9 and #10 are not replaced during the hatch year. Hunters are well aware that sharptails tend to form large flocks late in the season when their vigilance is increased, approach to within gun range is difficult and they typically fly far to cover once flushed. Early-season family groups are much more vulnerable to being hunted and could be pursued several times each, given their much shorter escape-flight distances. Thus, by simply moving the onset of hunting season to later in the year, the take by hunters could be reduced and the hunt made more challenging without altering bag limits.

Connelly et al. (1998) report that counting the number of dancing grounds and the number of grouse on dancing grounds provides a good indication of both population size and habitat use. A partial survey of the pasture in the spring of 2012, using a motorcycle for transportation, yielded five dancing grounds with grouse, trampled grass and droppings. One Co-op member reported a sixth dancing ground (Lloyd Hunter, pers. com.) One of the dancing grounds visited twice near sunrise yielded at least 29 grouse flying away. Connelly et al.[2] report a range in the number of grouse attending dancing grounds. Their reported maximums exceed Perdue's 29 in only four of the eight studies cited. The studies were carried out in five U.S. States in the past, from the 1940s in Michigan and Wisconsin to 1993 in Idaho.

Connelly et al.[2] report estimates of grouse densities for the breeding period and winter. My estimate of grouse density based on 41 km walked and a 300 m swath searched by the dogs, yielded 9.5 grouse/km^2. In this estimate I corrected for the same grouse sighted a second time, judging from direction flown, distance and time between sightings. In this way I removed 20 sightings from the total of 137 observed. I am not aware of comparable estimates in fall, at a time when flight-feather molt is near complete, and the number of well-flying, fully grown birds may be at its peak. Connelly et al.[2] report numbers of grouse in summer ranging from 0.6-7.0 grouse/km^2 in five studies

Considering i) the substantial number of grouse encountered while hunting, ii) the extrapolated density, iii) the high number of dancing grounds found in only

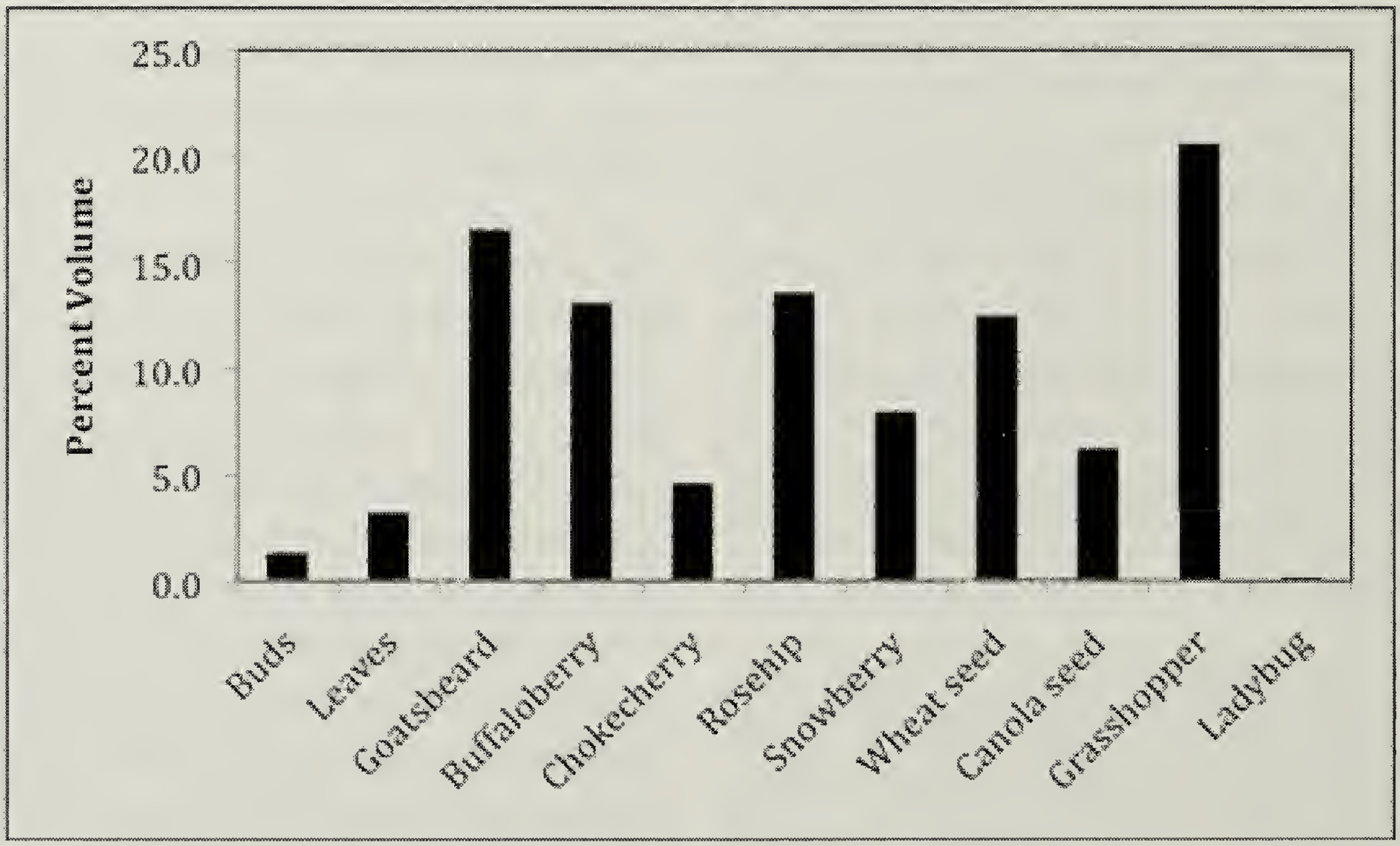

Figure 1. Crop contents showing visually estimated volumes of various food items from Sharp-tailed Grouse bagged on the Purdue Co-op community pasture between 15 Sept. and 2 Nov. 2013.

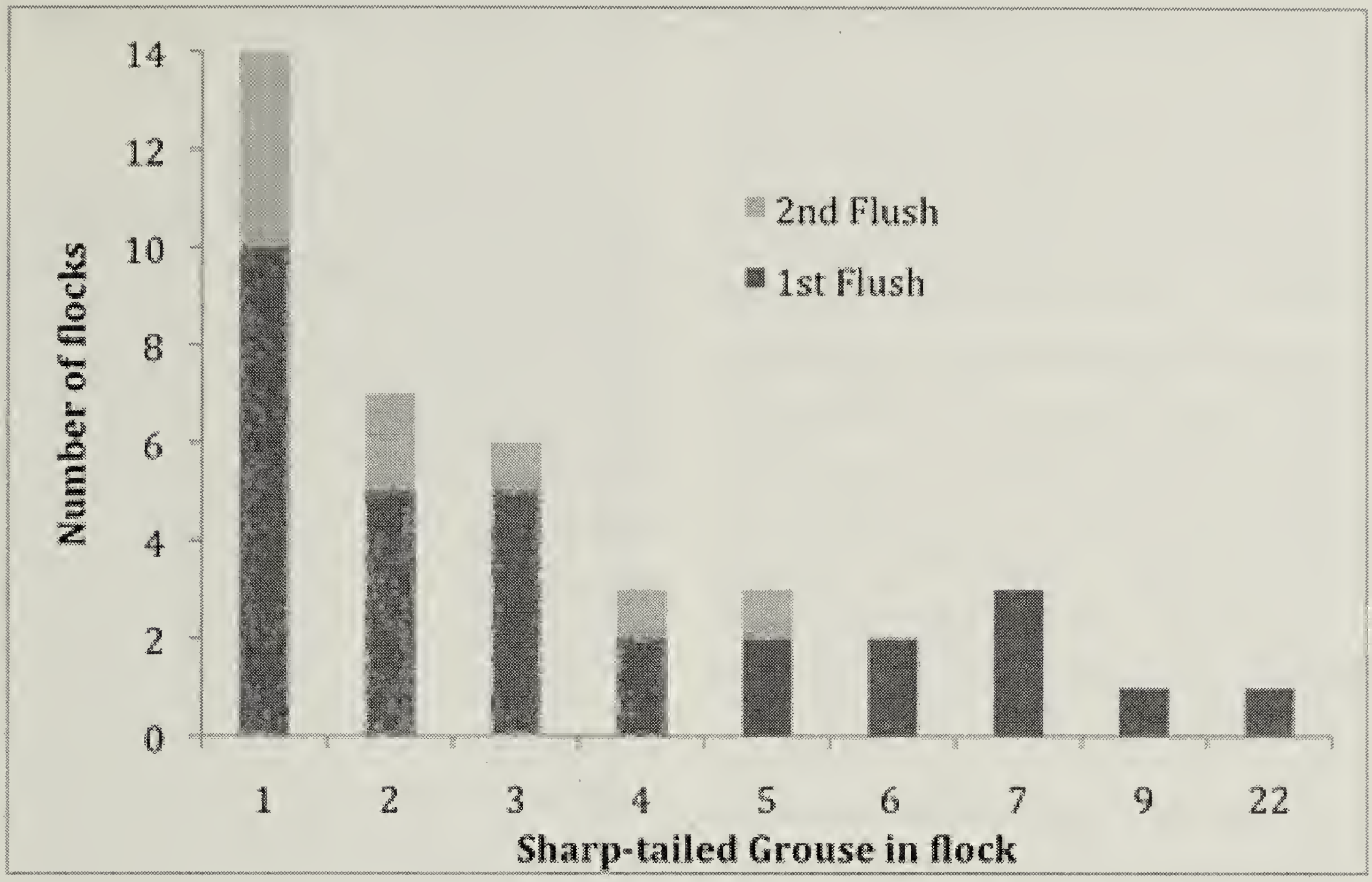

Figure 2. Number of Sharp-tailed Grouse encountered as singles or in flocks of varying size on the Purdue Co-op community pasture.

a portion of the native pasture and iv) the substantial number of grouse flying from a dancing ground at sunup in spring, together, suggests that the Sharp-tailed Grouse of the Perdue Co-op pasture are doing well in comparison to birds reported in other studies, and in other hunting areas in Saskatchewan based on my hunting experience.

Food

The crops of 12 Sharp-tailed Grouse, shot during the hrs of 1000 – 1600 ranged from empty (n = 1), partially filled (10) and full (1). The volume of individual food items in opened crops was estimated visually.

Plant items found in crops included stem buds, leaves, flower buds (goatsbeard), wheat and canola seed, and berries (Figure 1). The approximately 100 grasshoppers in seven crops appeared uniform in size and approximately 20 mm long. Grasshoppers and two ladybugs were the only insects found. Grasshoppers were in crops well after the first frost, up until October 13.

Grouse Distribution

Sharp-tailed Grouse occurred in flocks of varying size. They were found in a variety of habitats and habitat use appeared to change through the fall period. Grouse flushing as a group or in quick succession, even if up to 100 m apart, were considered a flock. The number of birds per ‘flush’ or flock varied from 1 to 22 (Fig. 2). Flock sizes in which a young grouse was shot were 7, 6, 6, 5 and 4. The group of 22 also had a young taken from it. This group split into three as it flushed and likely represented three family groups, that is the hens and their young. This small sample suggests that successful hens raised approximately 6 young to near maturity.

Grouse on the pasture flushed from open grass habitat 44% of the time, from grass but near shrubs 17%, and from inside shrubs/trees 39%. Short shrubs such as snowberry and rose seemed to be not as frequently used. Over the years, I found several night roosts in short shrub but never in grass; the cluster of droppings at a cup of depressed vegetation identified night roosts. The presence of a softer, deep brown dropping that reflects evacuation of the cecum further confirmed roosting over night. Whether grouse also roosted over night in tall shrub is unknown since these were difficult to walk through and thus I avoided them while the dogs did not. Given the food items that were consumed by grouse, feeding clearly takes place in shrubs for berries and in open grass for grasshoppers, where they could be seen while I was walking.

By the last hunting day on November 2nd, the grouse’s habits appeared to change. While during previous forays, the grouse were common throughout the interior of the pasture; the dogs could only find one grouse in the pasture’s interior in 2 hrs of hunting on 2 November. In contrast, during 1.5 hrs of hunting near the pasture border with stubble fields, we saw 15 grouse in 1.5 hrs of hunting. This was also the only time when the one grouse taken that day had grain (wheat & canola) in its crop. In late afternoon, some of the grouse were in high flight heading from the fields back into the pasture.

This near absence of grouse in the core of the pasture late in the season was also evident in previous two years of hunting. It is plausible, that when grasshoppers stop being active and bury themselves in debris and soil, the grouse seek waste grain in the surrounding fields. Once the waste grain in fields is out of reach below snow, the grouse likely return to consume the berries that were still evident on shrubs. After these are consumed, buds probably become a major food item.[2]

Grouse, cattle and ranchers in a 'working' landscape

The observations reported here suggest that the Purdue Co-op sharptail population is doing well. This can be logically attributed to the high quality native habitat maintained there – but then, why do the grouse continue to decline and require reduced bag limits? Our human relationships with grouse and grass is not static, it has changed dramatically and continues to change. How we manage this trajectory of change will influence the bag limits in the future and the level of bird watching that naturalists can enjoy. To explore how Saskatchewan might boldly 'move forward' vis-à-vis sharptails, it might be useful to examine our past.

No doubt, the first human residents of the Canadian Prairies, the Assiniboine, Blackfoot, Plains Cree, and Sarcee,[17] also took grouse, perhaps most effectively with snares. Subsequently, our Euro-Canadian relationship with prairie has changed. First, harvesting of grassland commodities for sale began with bison hides, meat and the bone trade.[18] Subsequently, with bison gone, the 'breadbasket mantra' of the early 1900s ran its course with a grassland conversion that was vastly out of sync with what the 'rain-shadow' ecosystem could sustain. This lead to enormous pain to people and a drain on the human economy.[19] Slow grassland loss, to the detriment of Sharp-tailed Grouse, continued to the 1970s.[20] Even if some grassland was not permanently cultivated, its quality was often reduced through overgrazing,[21] the introduction of Eurasian grass varieties[22,23] and fire suppression.[24]

Beginning in the 1970s, the remarkable value of native prairie came to be better recognized. After the 1970s a collective wisdom by naturalists, the agricultural community and policy makers began to mature.[25,26] Remnants of these and other transitions also found their expression on the Purdue Co-op pasture. However, a step backwards may be happening now with the dismantling of the PFRA Community Pasture Program.[27]

Today, when only 20% of the original prairie remains, the way in which this prairie is maintained is important. Maestas et al.[28] show that from a generalized biodiversity perspective, ranchers are important allies in conservation, especially those ranchers that are dependent on and derive most of their livelihood from grass and cattle. In cases where specific biodiversity benefits are sought, such as viable populations of Sharp-tailed Grouse, Greater

Sage-Grouse and other grassland birds, there may be a need for specific pasture management that goes beyond maintaining a ranch, however. PFRA pasture manager Mert Taylor[29] describes the local knowledge and management-care required in balancing water supply, favourable calf growth rates, healthy grass resources and drought resistance through maintenance of healthy soils, while combating invasive species. Could Saskatchewan move beyond mere monitoring to action by inviting ranchers to become allies in a strategic management of the remaining native prairie? Could such management employ know-how described by Mert Taylor to achieve strategic outcomes, a 'results-based approach' toward sustainable use of all natural resources for our generation and the next?

The management strategies of the ranchers at the Purdue Co-op pasture serve sharptails well. The ranchers have clearly thought through their approach for now, but if beef markets, climate or mixed farm transitions change in the future, will their approach remain viable? Might volatility in beef markets require less sharptail-friendly grass management for farm livelihoods? Will the next generation of farmer/ranchers still have the 100-year-long environmental memory to make land decisions that support sharptails?

I hope that many hunters and naturalists respond to the Ministry's call and report sightings. Sightings are valuable, but in and of themselves they cannot address the many critical factors identified by NABCI Canada.[6] Sightings are unlikely to replace strategic and dedicated research. Even research at its finest is a 'means to an end, not an end in itself.' The end in itself will require leadership and dedicated care of the kind Mert Taylor describes.[29]

Dedicated care for key natural landscapes is a global responsibility. On the Canadian Prairies, this is formally recognized under the Temperate Grasslands Conservation Initiative of IUCN,[30] the Biodiversity Convention, and the North American Free Trade Agreement. The community pasture system of the federal PFRA and provincial pastures, represent a significant opportunity for conservation if it can be realized for the future. Le Saout et al.[31] recommend that increased care is warranted on these small protected areas and that "... preventing species extinctions requires the strategic allocation of management efforts." The same applies in all likelihood to Saskatchewan's community pastures and Sharp-tailed Grouse. On Crown-owned pastures an opportunity for targeted management exists,[29] and if there are costs for this public benefit they should borne by the public and not the ranchers.

What can hunting dogs reveal about natural predation?

The fescue-grass community of the Perdue Co-op pasture shown in Photo 2 is mature, so much so that it has likely not seen more than a few cows passing over it in several years. Cattle need water to maintain them and to grow calves. Temporary ponds, dugouts and two wells provide stock water on the pasture. Areas around these water sources tend to be heavily grazed, areas 1 km away are used less and those more distant are grazed rarely if at all. Grouse and dense-grass-loving songbirds sustain themselves in this dense grass cover, and, theoretically, can produce a population surplus to re-populate marginal areas. The ranchers could develop more water bodies or transport it in tanker-trailers. However, they

Photo 2. *A Large Munsterlander, "Ulna", is holding a young Sharp-tailed Grouse after she had deciphered the family's tracks in the dense grass, where, judging from crop contents, they had been feeding on grasshoppers. The fescue grass community shown here is very mature. While studies might reveal reduced plant biodiversity at this near climax state, an alternate benefit is the dense escape cover this pasture portion provides for sharptail chicks. Photo by J. K. Schmutz.*

have decided to use this pasture lightly most years.

The young grouse held by the dog (Photo 2) was part of a family feeding on grasshoppers. Grouse require the previous year's vegetative growth to hide their nest for about 10 days of laying and 22 days of incubation.[2] This need to remain unnoticed by predators extends beyond the egg stage to young. Chicks can fly short distances at 7-10 days. Thus vegetation has to be suitable to provide food for chicks and escape cover for a full 40 days.

When the dogs encountered grouse, they used sight to ascertain flight direction and to mark a fall or landing spot. Beyond this limited use of sight, dogs use scent to locate birds. The dogs' use of scent and not sight was so pronounced that dogs at times can nearly step on a grouse without noticing it when wind and microhabitat make scenting difficult. Hunters refer to this as a bird 'air washed' during the fall. Interestingly, when Conover and Borgo[32] studied the sharptail's choice of loafing sites, they concluded that the sites selected by grouse made for poor scenting (e.g. updrafts). When visibility by potential predators was considered the sites were no different from random sites.

An explanation other than 'air-washed' is likely. Dogs, and presumably also all mammalian predators, detect two types of scent: 1) a bird's breath or the scent associated with body particles carried by wind or 2) scent left behind on the ground and vegetation while walking. A so-called air-washed bird was likely struck well enough in flight so that it died and stopped breathing by the time it hit the ground. Also, it did not move any more, leaving no track and thus leaving only a small amount of scent for a dog to detect.

To escape predation, grouse chicks scatter in flight and can do so as early as 7-10 days after hatching,[2] often prompted by the alarm calling and injury-feigning hen. When chicks land in dense grass, a predator will have more difficulty finding them, not being able to follow a chick's track. The dense vegetation conceals and provides a barrier for wind. Due to the chicks' small body, the exhaled air volume will be small. Whether young birds have additional survival strategies, such as reduced breathing rate under stress, is not known. Mammalian predators would likely have to be very close to find a hidden chick by chance. Dense vegetation, and vegetation like grasses that a chick can move into and out of, is important in this scenario. A corollary to dense-grass escape cover is the absence of cattle during the vulnerable nesting and brood rearing period, reducing mortality from trampling. Delayed grazing and no mowing are recommended conservation measures for Sharp-tailed Grouse.[2]

For grassland bird conservation a diversity of vegetation has been recommended that can satisfy the changing ecological needs birds have throughout the year.[33] Hunters can also encounter good numbers of Sharp-tailed Grouse at times when grazing pressure is high. Here, the grouse depend on shrubs for escape cover. A possible advantage for grouse may come from an earlier emergence of grasshoppers and other insects where the sun can warm the less shaded soil and warm it earlier in spring. A diverse matrix, as opposed to uniformity, of microhabitats appears desirable.

The Ministry of Environment's decision to reduce hunter bag limits is a choice that many hunters support vis-à-vis Sharp-tailed Grouse in Saskatchewan today. Fryxwell et al.[11] suggest that hunter-take be adjusted up or down regularly as warranted, especially for species faced with random changes in populations (e.g. weather related) or for species with long-term and regular population cycles. Akcakaya et al.[34] go yet further when they suggest that management strategies be balanced and that they "...must consider habitat and population dynamics simultaneously" in the management of Sharp-tailed Grouse. In view of only 20% of prairie remaining and only a portion being in a state that satisfies the Sharp-tailed Grouse's food and habitat requirements, it appears logical that strategic habitat management should become a priority.

A mix of heavily and lightly grazed areas exists on the Purdue Co-op pasture. The reasons for this fortuitous presence of suitable breeding, feeding and escape cover are several. Where water is available on the Purdue Co-op pasture, cattle tend to graze the area heavily. The converse is true at sites distant from water. As rancher Lloyd Hunter (pers. comm.) put it, they are well aware that droughts will recur. It costs the Hunter Ranch $270/day to feed their cow herd should drought limit pasture and forage supplies. During those dry years, the ranchers will put their cattle on the dense grass carryover of the Co-op pasture that they have saved for that purpose. One of the positive features of native prairie grasses is that they retain adequate forage quality into the following year.

Ranchers can gain weeks worth of grazing a year later, albeit with some loss of protein content (H.A. (Bart) Lardner, pers. comm.). The grass is “banked” for those dry periods, which as local knowledge and environmental memory tells us, will recur every so often in southern Saskatchewan.

These observations suggest that the Sharp-tailed Grouse population on the Perdue Co-op pasture are faring exceptionally well at a time when the species is declining province-wide. The observations also suggest that the habitat on the pasture is maintained in a way that favors sharptails. Sharptails are favoured fortuitously by ranch management that did not succumb to a ‘tragedy of the commons’[35] but maintained a view to long-term sustainability of ranch-family livelihoods. Bag limits are a necessary condition in the sustainable management of game species, but in and of themselves not a sufficient condition. The Perdue Co-op pasture serves as a model; the grouse know it, do we? This model provides an example for ‘Saskatchewan to move forward.’

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Sharp-Tailed Grouse *-Randy McCulloch*

POSSIBLE CAUSES OF DEATH OF A NESTLING GREAT GRAY OWL

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Introduction

Nestling deaths are not unusual in many species of birds that rely on prey whose availability may decline when the demand is greatest, during the chick-rearing period.[1] Brood reduction has been recorded in hawks and owls in cases of food shortage where adults occasionally kill their young (infanticide), or kill and eat them (cannibalism), or, in other cases, young may starve and are eaten by an adult or surviving siblings (scavenging).[2] Depredation by a variety of potential predators is always a possibility as well but before the use of surveillance cameras focused on active nests observers were usually only able to determine that a nestling died, not why it died or how it was killed. In this article, we present a case study of a nestling Great Gray Owl that died and evaluate the possible causes of death.

Case Study

During some winters, Great Gray Owls (*Strix nebulosa*) move widely in search of voles whose densities fluctuate over the landscape—some individuals die, whereas others settle in areas with ample prey and breed.[3-6] In late 1973 and through the winter of 1974, we recorded an increase in the number of Great Gray Owls observed in southeastern Manitoba, including the area around Lac du Bonnet. In early April 1974, we flushed a female from an empty nest in a stand of eastern cottonwood (*Populus deltoides*) along a road southeast of Lac du Bonnet (50°15'N, 96°4'W). The female was sitting on a different nest nearby when we next visited the site, in mid-April, but by 1 May, a clutch of three eggs had been laid in the nest from which we originally flushed the female. On 1 June, by climbing a neighbouring tree, small young could be seen in the nest (Figures 1, 2), but by 13 June one of the chicks had disappeared, leaving two young. On 21 June, we found the wing of a gray owl nestling on the ground under the nest, neatly severed from the body (Figure 3). The wing, catalogued in the collection of the University of Manitoba Zoology Museum (UMZM 2933),

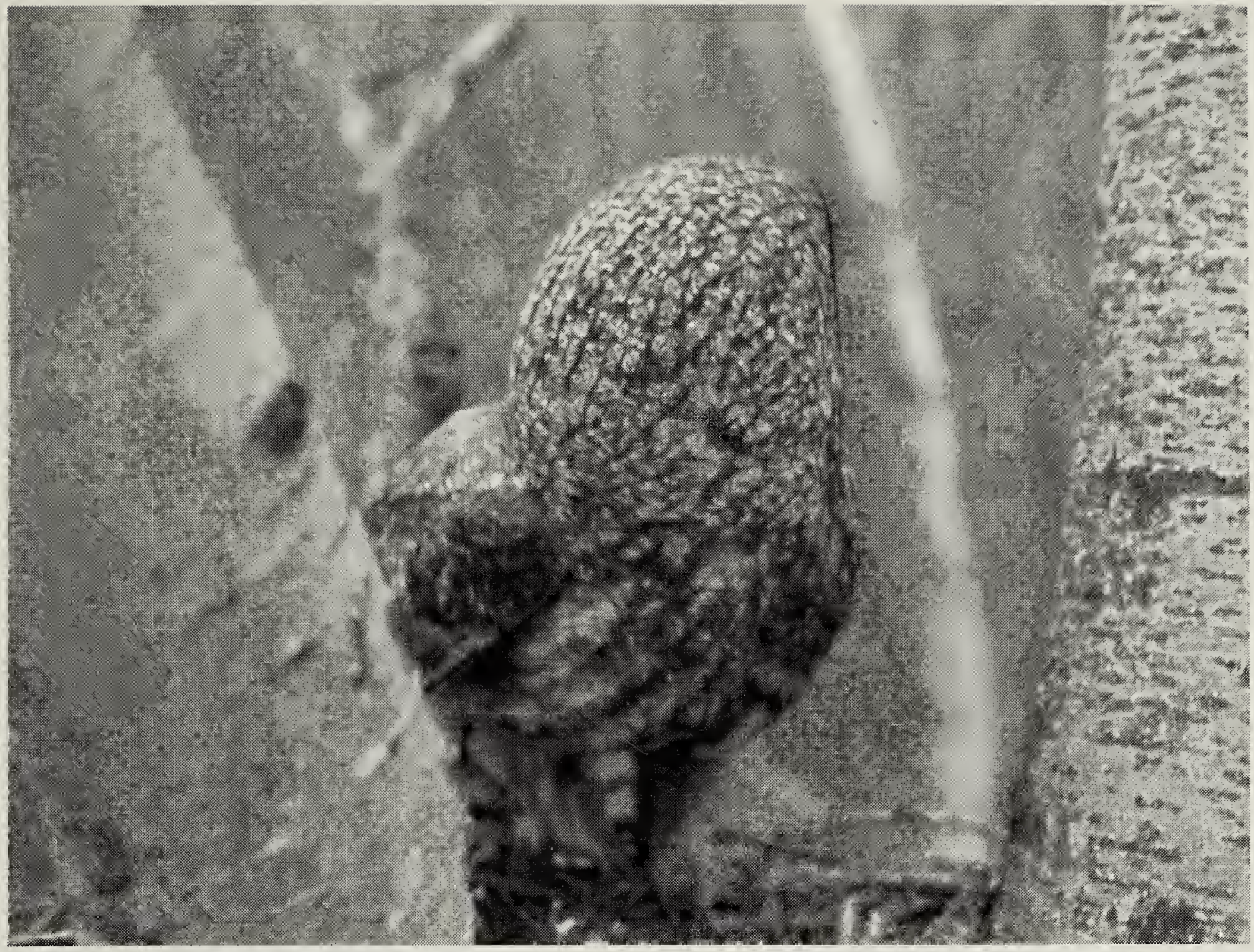

Figure 1. Great Gray Owl, standing over three recently hatched young, distracted momentarily by the male's calls a short distance from the nest, near Lac du Bonnet, Manitoba, 1 June 1974.
-S.G. Sealy

bore recently unsheathed primaries and secondaries (Figure 3). The cause of this nestling's death was not determined but the remains provide an opportunity to speculate on a possible cause of its death.

The conclusion of death of nestlings often is based only on the premature disappearance of one or more young from the nest,[7] because the event is seldom witnessed,[8-10] although use of video cameras may change this.[10] Careful observations are needed, therefore, when distinguishing between acts of infanticide, scavenging and cannibalism, heeding McNicholl's caution that "The selection pressures for eating an already dead animal may be substantially different from those involved in killing another animal of the same species, especially kin, and then eating it".[2] Here, we examine each of these behaviours, as well as predation, in seeking an explanation for the death of this nestling Great Gray Owl.

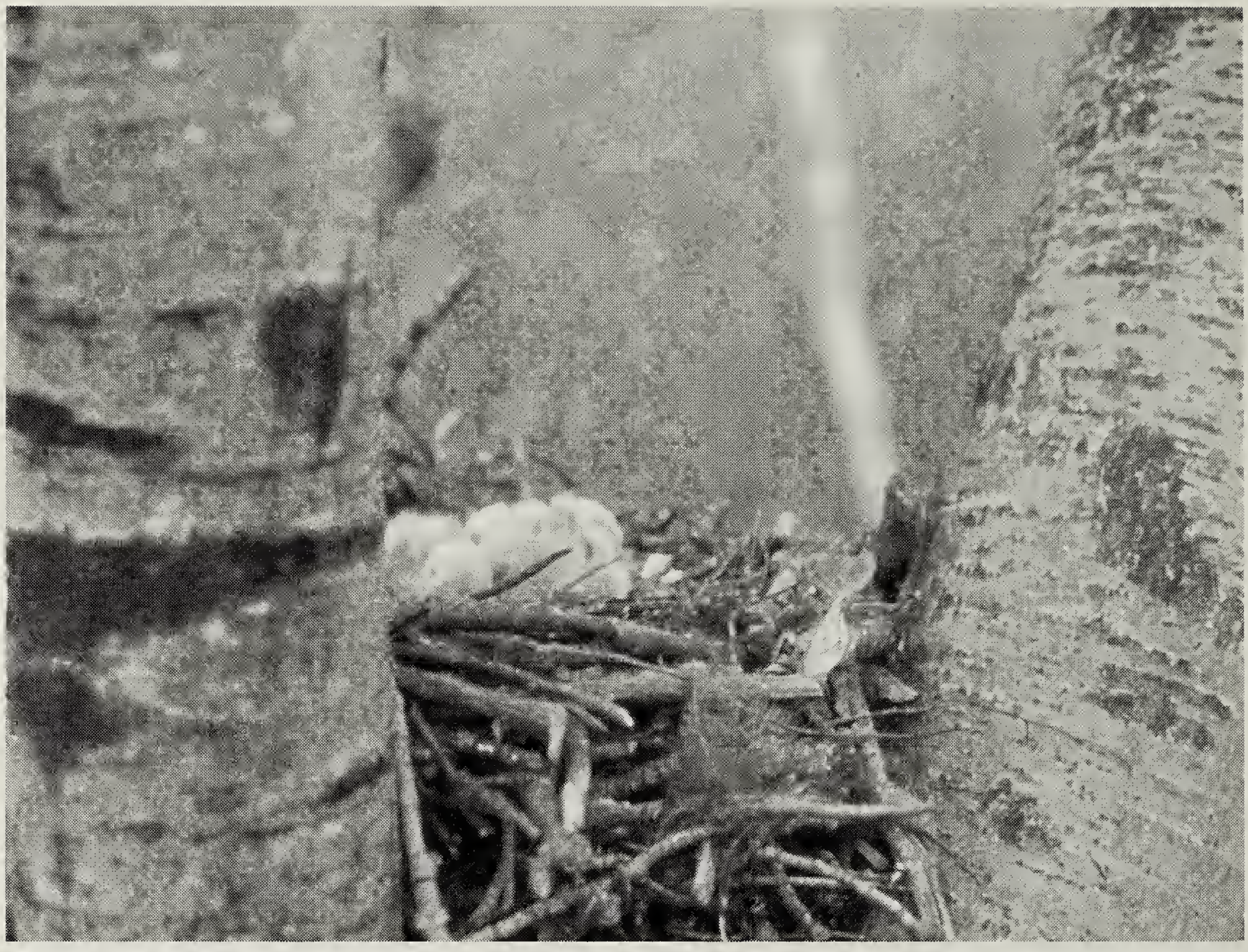

Figure 2. Three recently hatched young Great Gray Owls, near Lac du Bonnet, Manitoba, 1 June 1974. *-S.G. Sealy*

Infanticide and cannibalism involve individuals of the same species.[2,12,13] Cannibals are genetically related or unrelated individuals that feed on already-dead individuals of the same species, whereas infanticide is a behaviour in which an adult aggressively kills offspring (termed filial infanticide if the young are its own), which may be followed by the parents' consumption of the young (filial cannibalism).[7,8,10,11] Killing of dependent offspring or eating already-dead individuals, such as those that have starved, may provide direct or indirect fitness benefits to the perpetrator; in the first case, males may gain access to females or increase available resources and the chances of survival of at least some of the young[11] or, in the latter case, supplement the food supply.[10] Depredation involves individuals killing and eating unrelated individuals.

We believe that none of these brood-reduction scenarios occurred at this nest, because we would have expected the salvaged portion of the wing to have been among other remains egested in pellets, with the bones partially digested and disarticulated, and the feathers initially wet but now in disarray. This was not the case, as the wing and its feathers were intact and not disheveled (Figure 3), suggesting the nestling had died and was in some way removed from the nest, or it accidently fell out of the nest, perhaps when the female owl flushed.[5] On the ground, the carcass may have been scavenged by a mammal, as the wing appeared to have been severed cleanly from the body (Figure 3). Another possibility is that the nestling was killed in the nest and removed by an avian or mammalian predator,[6] but this leaves us in the uncomfortable position of guessing its identity based on a list of possible predators that are known to occur in the area, especially because there were no clues such as identifiable tracks or tell-tale feathers in the vicinity.

We cannot know what befell this nestling other than that it died, or it was killed, and apparently partially consumed. Was it the last-hatched young in the brood and, therefore, several days younger and possibly less competitive than its older siblings? Disparities in the ages of individuals in broods

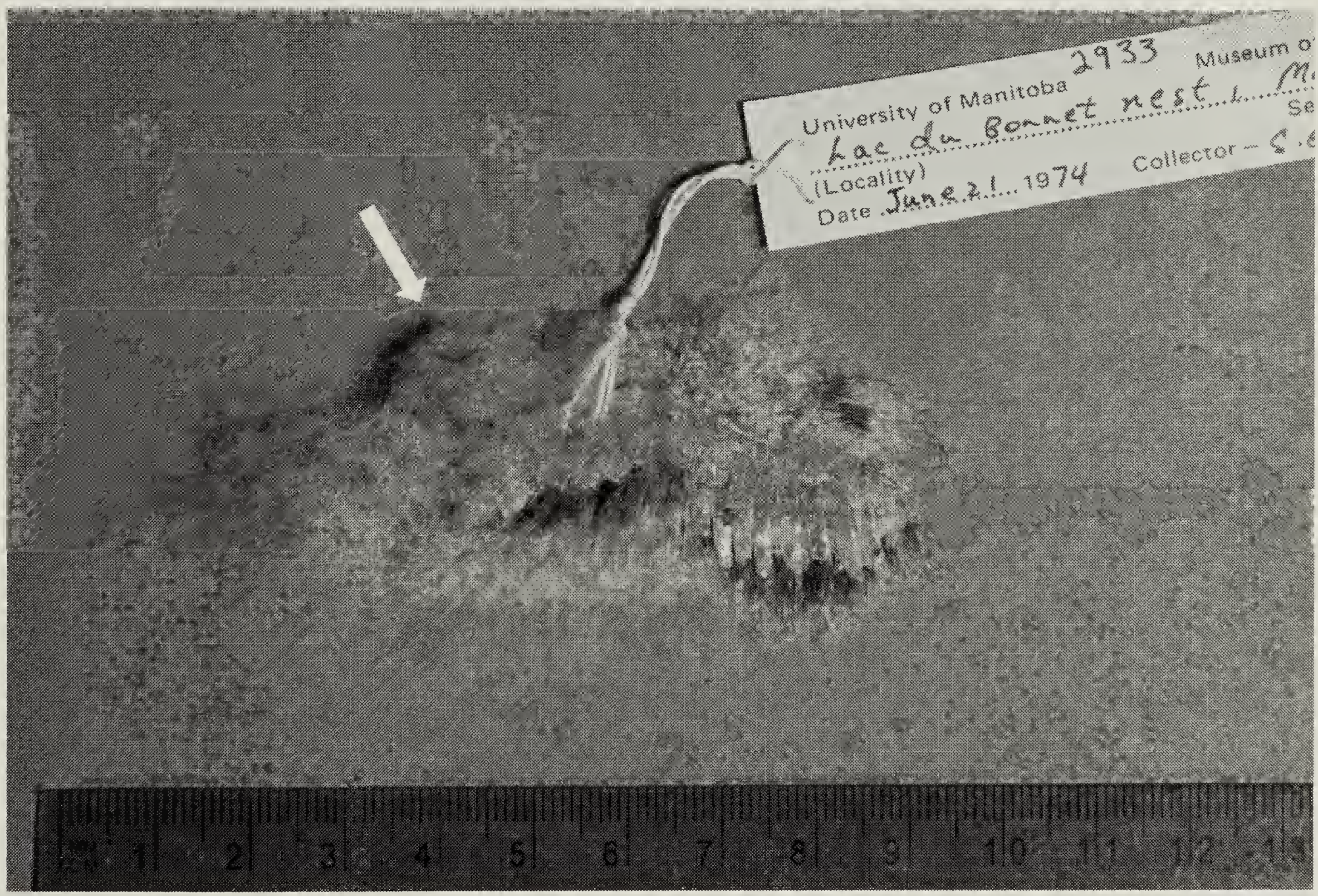

Figure 3. Ventral side of left wing of nestling Great Gray Owl (UMZM 2933) found under a nest near Lac du Bonnet, Manitoba, 21 June 1974. Arrow points to the humerus where the wing was severed. The recently unsheathed primaries and secondaries are visible.

-S.G. Sealy

of species such as the Great Gray Owl, which initiate incubation as soon as the first egg is laid, set up the means to feed the larger and older young in cases of food shortages. Further research, using video cameras, may establish the prevalence of the different sources of mortality during brood reduction in raptorial species, and their various ecological effects.

Postscript

The two siblings, both banded, left the nest (Figure 4) but it was not determined whether they survived to independence. We inspected the nest late the following winter in anticipation of it being used again in 1975, but undisturbed snow in the nest bowl in March (Figure 5) suggested that a Great Gray Owl was not visiting it. Subsequent visits that year and for at least the following three years confirmed that these nests were not used again

Acknowledgements

We appreciate the companionship of Herbert W. R. Copland and the late Robert R. Taylor during many of our forays throughout southeastern Manitoba and northwestern Minnesota in search of Great Gray Owls and their nests. James C. Duncan commented on an early draft of the manuscript, and we thank Blue Jay editors and an anonymous reviewer for editorial comments on a later draft.

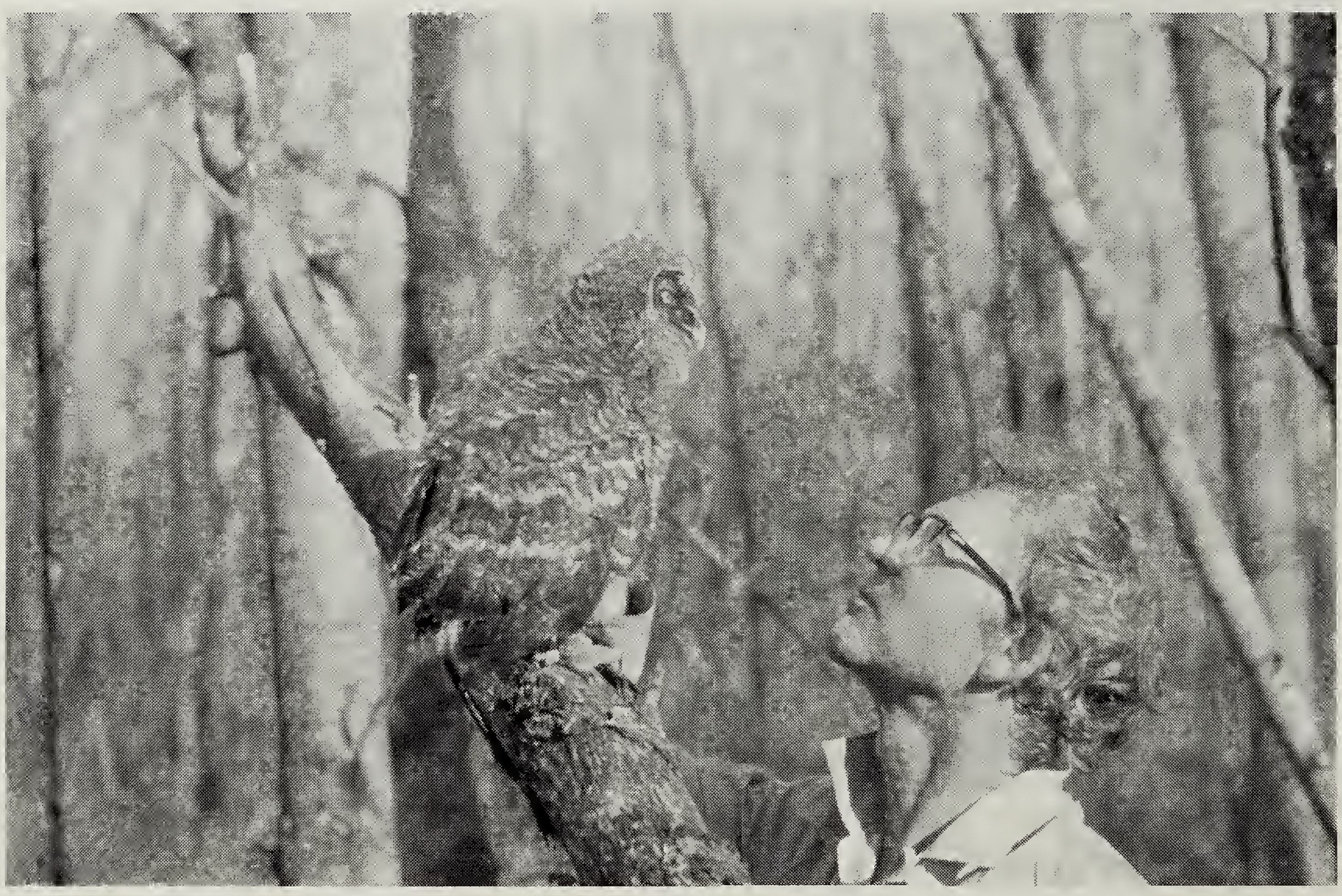

Figure 4. Robert W. Nero and one of two Great Gray Owls that fledged from a nest near Lac du Bonnet, Manitoba, July 1974. -S.G. Sealy

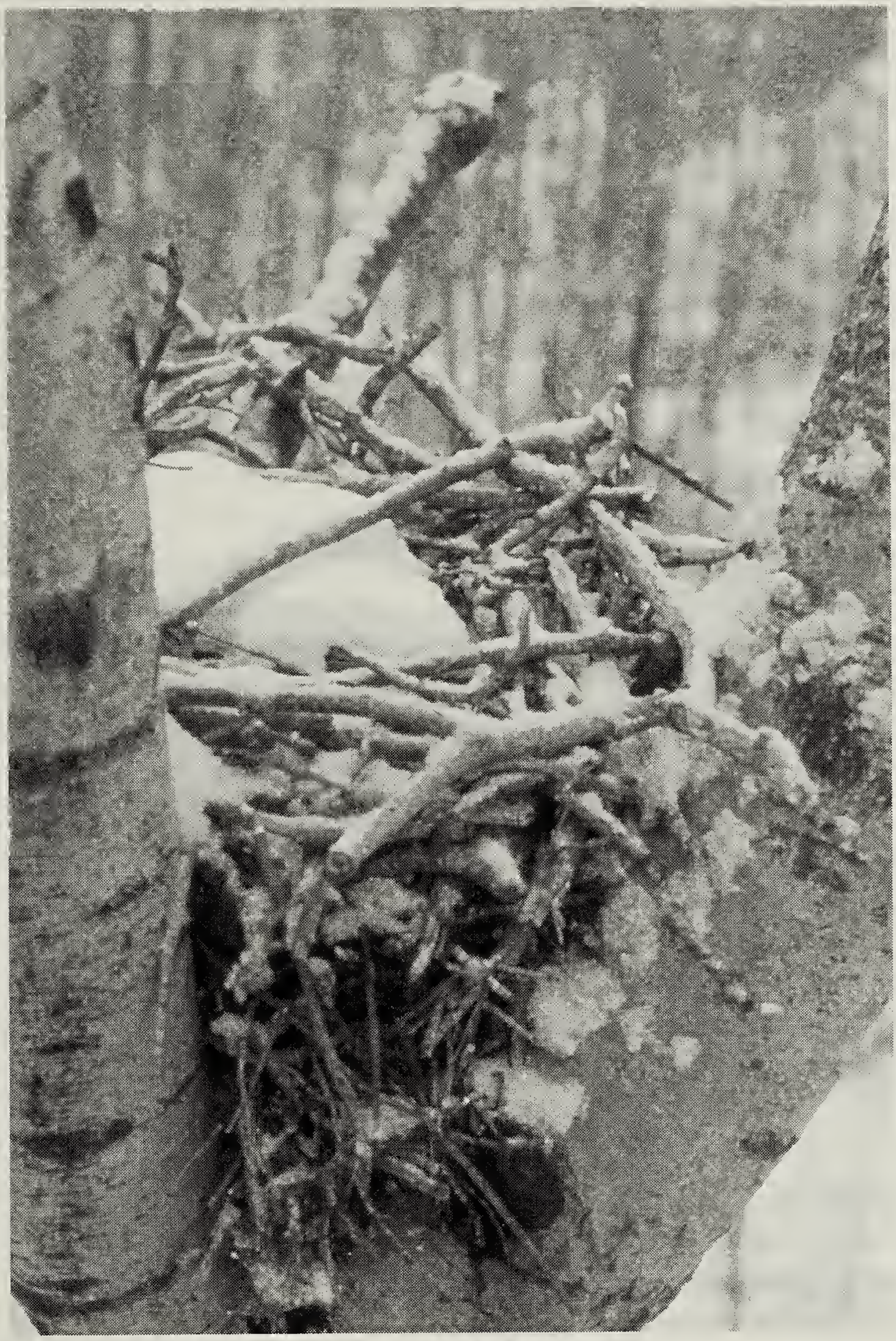

Figure 5. Nest near Lac du Bonnet, Manitoba, from which two Great Gray Owls fledged in 1974. Undisturbed snow in the nest bowl in late March 1975 suggested that this nest would not be used again that year, which was later confirmed. *-S.G. Sealy*

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MAMMALS

41st ANNUAL SASKATCHEWAN CHRISTMAS MAMMAL COUNT - 2013

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Only 79 Christmas Mammal Counts were conducted this winter - the fewest since 1995. A paltry 2147 mammals were seen or heard this CMC, about two-thirds of last year's 3382 and the fewest since 1993. Much of this was due to the decline in the number of White-tailed Deer, which dropped by half from last year's 1421 to 733. Mule Deer fared much better dipping only slightly from 669 to 601. As with the birds, the average number of species per count fell from 4.4 in 2012 to 4.0 this year. No new species were added; the all-time total remains at 49.

Like the Eurasian Collared-Dove, the Eastern Fox Squirrel continues to expand its range. After appearing on the Qu'Appelle Dam count 2 years ago, it showed up 30 km to the northwest on Gardiner Dam count on December 16. This suggests it will show up in Outlook in another two years. Franklin's Ground Squirrel at Saskatoon was only the second on the count; the previous record of this species that normally hibernates, was one seen at Asquith December 23 1975.

For information on participants, weather, coverage and location of CMCs see the CBC summary in this issue.

Explanation of entries in Table 1. The number of mammals actually seen or heard on count day is treated separately from those recorded by other means or those recorded during count period (14 December to 5 January) but not on count day. Numbers of individuals seen or heard are given in Table 1 and are tallied in the first line of totals at the bottom of the table. The number of species they represent is given in the second line.

For species only detected by tracks or by other means, or that are seen or heard only in the count period but not on count day, no numbers of individuals is given in Table 1. Species detected only by tracks are indicated by 't' in the table; those detected only by other means (dead animals 'm', more clearly identifiable chewing or digging 'd', dens or lodges 'L' (including Muskrat push-ups) and by smell 's.' Species detected by any means during the count period, but not on count day are indicated by 'c' in the table. These additional species are tallied in lines 3, 4 and 5 at the bottom of the table. If a mammal is reported as member of a species group (i.e. mouse species, deer species), it is counted as a species only if no other species in this group has been definitely recorded. The columns at the end of the table, give totals for each species.

Table 1-1. 41st Saskatchewan Christmas Mammal Count-2013.

CBC number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
SPECIES	Archerwill, 16 Dec 2013	Avonlea, 3 Jan 2014	Balgonie, 4 Jan 2014	Bangor , 20 Dec 2013	Biggar, 27 Dec 2013	Birch Hills, 30 Dec 2013	Borden - Radisson, 17 Dec 2013	Broadview, 26 Dec 2013	Cater, 4 Jan 2014	Chatsworth S.D., 4 Jan 2014	Clark's Crossing, 14 Dec 2013	Coronach 22 Dec 2013	Craven, 14 Dec 2013	Creighton, 21 Dec 2013	Crooked Lake, 26 Dec 2013	Crooked River, 31 Dec 2013	Cypress Hills P.P., 30 Dec 2013	Denholm, 25 Dec 2013	Eastend, 17 Dec 2013	Edenwold, 28 Dec 2013
Shrew species																				
Eastern Cottontail																				
Nuttall's Cottontail																	t			
Snowshoe Hare	1				t	t	t	t	t		t		1	t				1		
White-tailed Jack Rabbit			t	7	t		t	t				t					t	1		
Franklin's Ground Squirrel																				
Richardson's Ground Squirrel																				
Eastern Grey Squirrel													2							
Eastern Fox Squirrel		1	6					5					11							3
American Red Squirrel	1			2		1	1	2	1	2	2		1	5	4	4	6	2		
Northern Flying-Squirrel	1																	1		
American Beaver								L							L					
Deer Mouse								t											t	
Muskrat					L			L							L				1	
Gapper's Red-Backed Vole																		3		
Meadow Vole																				
Vole species					t			t				t		t	t					
House Mouse																				
Mouse species												t								
American Porcupine						t	2	d	1						t					
Coyote	1		t	3	1	t	1	t		4	2	1	2	1	1		4	4	3	
Gray Wolf																				
Red Fox	1		1	1			t	t		1		t		4	t			1		
Raccoon															1					
Fisher																				
Ermine								t												
Long-tailed Weasel			t	1				t						t		c	t			
Least Weasel																				
Weasel species	t					t						t								
American Mink	1							t							1				1	
American Badger											1				1			d		
Striped Skunk							s													
River Otter														t						
Mountain Lion																			t	
Canada Lynx														t						
Mule Deer					6		7				1	7	9		5		2	t	45	
White-tailed Deer	7		1	5	1	1	1	t	c	12	22	4	25		t	1	58	t	13	
Deer species																				
Moose	2			t				t	c					t		1	t	c	t	
Elk	c																			
Pronghorn																				
Totals seen/heard on count day	15	1	8	19	8	2	12	7	2	19	28	12	51	10	13	6	70	13	63	3
Total species seen/heard	8	1	3	6	3	2	5	2	2	4	5	3	7	3	6	3	4	7	5	1
Total species recorded by tracks	1	0	3	1	3	4	3	11	1	0	1	4	0	6	4	0	4	2	3	0
Total species otherwise recorded	0	0	0	0	1	0	1	3	0	0	0	0	0	0	2	0	0	1	0	0
Species recorded count period	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	1	0	0
Total species count period and day	10	1	6	7	7	6	9	16	5	4	6	7	7	9	12	4	8	11	8	1

Table 1-2. 41st Saskatchewan Christmas Mammal Count-2013.

CBC number	21	22	23	24	25	26	27	28	30	32	33	34	36	37	38	39	40
SPECIES	Endeavour, 1 Jan 2014	Estevan, 1 Jan 2014	Estuary North, 1 Jan 2014	Fenton, 2 Jan 2014	Floral, 24 Dec 2013	Fort Qu'Appelle, 22 Dec 2013	Gardiner Dam, 16 Dec 2013	Good Spirit Lake, 4 Jan 2014	Grasslands N.P. 17 Dec 2013	Grenfell, 29 Dec 2013	Harris, 20 Dec 2013	Hazlet, 26 Dec 2013	Indian Head, 27 Dec 2013	Kenaston, 14 Dec 2013	Kenosee Lake, 2 Jan 2014	Ketchen, 26 Dec 2013	Kilwinning, 27 Dec 2013
Shrew species																	
Eastern Cottontail		5															
Nuttall's Cottontail					1		2					1					
Snowshoe Hare	t			t		3		2		t	t		t		t	t	
White-tailed Jack Rabbit		1			t		t		2	1				t			
Franklin's Ground Squirrel																	
Richardson's Ground Squirrel																	
Eastern Grey Squirrel																	
Eastern Fox Squirrel		6				1	1			4			7				
American Red Squirrel	2			1		10		2		1			22		4		4
Northern Flying-Squirrel																	
American Beaver								L		L				L	L	L	
Deer Mouse							t										
Muskrat				L	L		L				L	t	1				
Gapper's Red-Backed Vole						c											
Meadow Vole	4											1					
Vole species		t					t				t						
House Mouse						1		t									
Mouse species								t	1			t					
American Porcupine	2					c	2		1		1		2	2		1	
Coyote	t	2	3	t		4	4	2	8	1	1	t	3	t	t	4	1
Gray Wolf																	
Red Fox		1			t	1				1	1		4		t		
Raccoon						c								t			
Fisher																	
Ermine	1							1		t							
Long-tailed Weasel														t			
Least Weasel	1																
Weasel species											t						
American Mink		T											1				
American Badger												d					
Striped Skunk					1												
River Otter																	
Mountain Lion																	
Canada Lynx																	
Mule Deer		24	28		5		13		234		18		6	6			
White-tailed Deer	4		27	t		25	17	11	11	4	3		3	4	6	7	t
Deer species												t					
Moose	1							t					3	2	m	c	
Elk																	
Pronghorn									t		40						
Totals seen/heard on count day	15	39	58	1	7	45	39	18	257	12	64	2	52	14	10	12	5
Total species seen/heard	7	6	3	1	3	7	6	5	6	6	6	2	10	4	2	3	2
Total species recorded by tracks	2	2	0	3	2	0	3	2	1	2	3	4	1	4	3	1	1
Total species otherwise recorded	0	0	0	1	1	0	1	1	0	1	1	1	0	1	2	1	0
Species recorded count period	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	1	0
Total species count period and day	9	8	3	5	6	10	10	8	7	9	10	6	11	9	7	6	3

Table 1-3. 41st Saskatchewan Christmas Mammal Count-2013.

CBC number	41	42	43	44	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
SPECIES	Kindersley North, 26 Dec 2013	Kinloch, 3 Jan 2014	Kyle, 19 Dec 2013	Lac La Plonge, 16 Dec 2013	Leader North, 26 Dec 2013	Love-Torch River, 26 Dec 2013	Luseland, 2 Jan 2014	Macdowall, 29 Dec 2013	Meadow Lake, 26 Dec 2013	Moose Jaw, 15 Dec 2013	Moose Mountain P.P., 30 Dec 2013	Morse, 30 Dec 2013	Nipawin, 28 Dec 2013	Nisbet Forest Northwest, 30 Jan 2014	Nisbet Forest West, 5 Jan 2014	Outlook, 26 Dec 2013	Pierce Lake, 15 Dec 2013	Pike Lake,4 Jan 2014	Prince Albert, 15 Dec 2013
Shrew species																			
Eastern Cottontail																			
Nuttall's Cottontail			4																
Snowshoe Hare		1				t												t	t
White-tailed Jack Rabbit	5		4		2	t		t			t	1						t	
Franklin's Ground Squirrel																			
Richardson's Ground Squirrel														c					
Eastern Grey Squirrel																			
Eastern Fox Squirrel										6									
American Red Squirrel				c		14		2	1		2		5		4		5	8	20
Northern Flying-Squirrel																			
American Beaver																			2
Deer Mouse																		1	t
Muskrat								L									2		L
Gapper's Red-Backed Vole																			
Meadow Vole																			
Vole species						t								t					
House Mouse														m					
Mouse species			t		1	t				t				t					
American Porcupine					1	t													
Coyote	4	t	4		3	2	1	t		4		11		7		1	1		8
Gray Wolf		t				t													
Red Fox			1			3		t			t	2		t					3
Raccoon												t							
Fisher																			
Ermine																			1
Long-tailed Weasel				1		1												t	t
Least Weasel																			
Weasel species		t						t											
American Mink																			
American Badger								d											
Striped Skunk						2													
River Otter																			
Mountain Lion																			
Canada Lynx																			
Mule Deer	4		16		22		1					17				16			
White-tailed Deer		9	87		12	59	9		5	4	t	120	23	t	c		11	18	23
Deer species																			
Moose		t	2		2	t					1						2	t	
Elk		c				t													
Pronghorn			52									2							
Totals seen/heard on count day	13	10	170	1	43	81	11	2	6	14	3	153	28	7	4	17	21	27	57
Total species seen/heard	3	2	8	1	7	6	3	1	2	3	2	6	2	1	1	2	5	3	6
Total species recorded by tracks	0	4	1	0	0	8	0	4	0	1	3	1	0	3	0	0	0	4	3
Total species otherwise recorded	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	1
Species recorded count period	0	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Total species count period and day	3	7	9	2	7	14	3	7	2	4	5	7	2	6	2	2	5	7	10

Table 1-4. 41st Saskatchewan Christmas Mammal Count-2013.

CBC number	61	62	63	64	66	67	68	69	70	71	72	73	74	75	76
SPECIES	Qu'Appelle, 29 Dec 2013	Qu'Appelle Dam, 15 Dec 2013	Raymore, 5 Jan 2014	Regina, 28 Dec 2013	Roscommon, 26 Dec 2013	Rouleau, 4 Jan 2014	Round Lake (P.A.) 2 Jan 2014	Round Lake (Q.V.), 16 Dec 2013	Saltcoats, 28 Dec 2013	Saskatchewan Landing P.P., 29 Dec 2013	Saskatchewan River Forks, 14 Dec 2013	Saskatoon, 26 Dec 2013	Sawyer Lake,1jan 2014	Shamrock, 3 Jan 2014	Snowden, 4 Jan 2014
Shrew species													1		
Eastern Cottontail															
Nuttall's Cottontail		3								1		t			
Snowshoe Hare	t		t	t	t						t	2	c		t
White-tailed Jack Rabbit		t		2	t	3				t		2		1	
Franklin's Ground Squirrel												1			
Richardson's Ground Squirrel															
Eastern Grey Squirrel				6								2			
Eastern Fox Squirrel	5	2	1	35											
American Red Squirrel				3	t			2	1		6	12	1		5
Northern Flying-Squirrel															
American Beaver			L					L				d	L		
Deer Mouse			c								t	t			
Muskrat	L		L					L			L	1	L		
Gapper's Red-Backed Vole															
Meadow Vole															
Vole species	t		c					t				t	t		
House Mouse					t										
Mouse species		1			t					t			1		
American Porcupine	2	3			t	c					t				
Coyote	1	19	t	3	t			1		8	4	3	t		
Gray Wolf											t		t		
Red Fox	2			2	t			t		1	t	t			
Raccoon					2										
Fisher													t		
Ermine													t		
Long-tailed Weasel			c								t				
Least Weasel					t										
Weasel species	t				t		c	1				t			t
American Mink	c						c						c		
American Badger								d							
Striped Skunk															
River Otter													c		
Mountain Lion															
Canada Lynx															
Mule Deer		41			c					14	7				
White-tailed Deer	2	5	2		t	c			t	3	3	4	c	9	4
Deer species								t							
Moose	t	2		t	t						t		c		
Elk											t		t		
Pronghorn															
Totals seen/heard on count day	12	76	3	51	2	3	0	4	1	27	20	27	3	10	9
Total species seen/heard	5	8	2	6	1	1	0	3	1	5	4	8	3	2	2
Total species recorded by tracks	4	1	2	2	10	0	0	3	1	2	8	5	6	0	2
Total species otherwise recorded	1	0	2	0	0	0	0	3	0	0	1	1	2	0	0
Species recorded count period	1	0	3	0	1	2	2	0	0	0	0	0	5	0	0
Total species count period and day	11	9	9	8	12	3	2	9	2	7	13	14	16	2	4

Table 1-5. 41st Saskatchewan Christmas Mammal Count-2013.

CBC number	79	80	81	82	83	85								
SPECIES	Swift Current, 21 Dec 2013	Togo, 5 Jan 2014	Weyburn, 14 Dec 2013	White Bear, 2 Jan 2014	Whitewood, 28 Dec 2013	Yorkton, 20 Dec 2013	# individuals seen/heard count day	# Counts seen/heard	# Counts recorded as tracks	# Counts recorded as other	# Counts, count period	# Counts, count period & count day	High count	% Counts seen/heard
Shrew species							1	1	0	0	0	1	1	1.0
Eastern Cottontail							5	1	0	0	0	1	5	1.0
Nuttall's Cottontail	2			1			15	8	2	0	0	10	4	8.4
Snowshoe Hare		7			t		18	8	26	0	1	35	7	8.4
White-tailed Jack Rabbit	2		3	1	t		38	16	17	0	0	33	7	16.8
Franklin's Ground Squirrel							1	1	0	0	0	1	1	1.0
Richardson's Ground Squirrel							0	0	0	0	1	1	0	0.0
Eastern Grey Squirrel	14						24	4	0	0	0	4	14	4.2
Eastern Fox Squirrel			14		5		113	17	0	0	0	17	35	17.8
American Red Squirrel		6			2	3	196	43	1	0	1	45	22	45.1
Northern Flying-Squirrel		4					6	3	0	0	0	3	4	3.1
American Beaver					L		2	1	0	12	0	13	2	1.0
Deer Mouse							1	1	6	0	1	8	1	1.0
Muskrat					L	L	5	4	1	16	0	21	2	4.2
Gapper's Red-Backed Vole							3	1	0	0	1	2	3	1.0
Meadow Vole	1						6	3	0	0	0	3	4	3.1
Vole species					t		0	0	15	0	1	16	0	0.0
House Mouse							1	1	2	1	0	4	1	1.0
Mouse species				t	t		4	4	11	0	0	15	1	4.2
American Porcupine					c		20	12	5	1	3	21	3	12.6
Coyote	2	1	3	1	c	1	156	48	14	0	1	63	19	50.4
Gray Wolf		2					2	1	5	0	0	6	2	1.0
Red Fox	1		2		1		36	22	13	0	0	35	4	23.1
Raccoon							3	2	2	0	1	5	2	2.1
Fisher							0	0	1	0	0	1	0	0.0
Ermine							3	3	3	0	0	6	1	3.1
Long-tailed Weasel							3	3	8	0	2	13	1	3.1
Least Weasel							1	1	1	0	0	2	1	1.0
Weasel species							1	1	10	0	1	12	1	1.0
American Mink							4	4	2	0	3	9	1	4.2
American Badger	1						3	3	0	4	0	7	1	3.1
Striped Skunk							3	2	0	1	0	3	2	2.1
River Otter							1	1	1	0	1	3	1	1.0
Mountain Lion							0	0	1	0	0	1	0	0.0
Canada Lynx							0	0	1	0	0	1	0	0.0
Mule Deer	46	c					601	27	1	0	2	30	234	28.3
White-tailed Deer	6	26	5		t	2	733	50	11	0	4	65	120	52.5
Deer species				t			0	0	3	0	0	3	0	0.0
Moose		1			1		20	12	13	1	4	30	3	12.6
Elk		24					24	1	3	0	2	6	24	1.0
Pronghorn							94	3	1	0	0	4	52	3.1
Totals seen/heard on count day	75	71	27	3	9	6	2147							
Total species seen/heard	9	8	5	3	4	3		33						
Total species recorded by tracks	0	0	0	2	5	0			26					
Total species otherwise recorded	0	0	0	0	2	1				7				
Species recorded count period	0	1	0	0	2	0					15			
Total species count period and day	9	9	5	5	13	4						37		

NOTES and LETTERS

Monarch Butterflies in 2013

ARDYTHE MCMASTER, Manitoba

I never discourage the milkweed plants that pop up in my garden, for I know that milkweed, hosts the regal Monarch butterfly. The finishing touch on my garden is always the sight of a Monarch or two fluttering among the flowers.

The summer of 2012 offered us many Monarchs. They arrived unusually early in the season, and set about their summer business. What fun to come upon some tiny Monarch hatchlings! Measuring hardly more than a quarter inch, they were nevertheless easy to identify in their tiny yellow, white and black stripes.

They did not remain tiny for long. They nibbled, and munched, and then chomped on their milkweed menu, (though the milkweed did not seem to mind), and in no time those Monarch larva had grown to a couple of inches in length.

Stepping outside one sunny morning, I saw that a sun ray had caught something shiny at the far end of the garden. I hurried over to investigate and there it was, the first Monarch chrysalis, gleaming bright gold and green from beneath its leaf.

That summer, many Monarchs soared and fluttered over my garden and our prairie.

But that was last year. This summer, 2013, I watched in vain for Monarchs. Not one until, on the sunny afternoon of September 29, a single one appeared briefly, then disappeared.

One single Monarch. It is disheartening to learn that 2013 brought a widespread, unexplained crash in Monarch population numbers across all of the range. I can only hope that better conditions, and my milkweed, will bring them back to my garden, to our prairie, and to their vast migration range.

Monarch butterfly

- Kerry Hecker, LML NWA

99% Population Crash in Grass Moths (*Crambus* sp.) at The Pas, Manitoba.

WALTER KRIVDA, Box 864, The Pas, MB. R9A 1K8

Anyone who mows grass knows the small white moths that fly 2 meters ahead of the mower. They rise and settle again, and some years they occur in swarms. They were absent this year. This was the first year in my memory that all *Crambus* had completely vanished – none flew ahead of the mower. I watched particularly if a later flight occurred – none did. There are several species that fly together over our lawns. Apparently all the species crashed. A few specimens came to lights on the red brick walls of the Margaret Barber Collegiate Institute. Some are pinned for future reference.

Would the larvae provide food for young birds just out of their nests? How wide spread, geographically, was the *Crambus* crash? If observers would watch in 2014 to see if the *Crambus* would return, it would be a neat bit of data.

Crambus moth (colour image on back cover) *-Harvey Schmidt*

SASKATCHEWAN'S ANTI-CROW CAMPAIGN: A RETROSPECTIVE ACCOUNT

C. STUART HOUSTON, 863 University Drive, Saskatoon SK S7N 0J8

Edward R. Kalmbach, a senior assistant biologist with the U.S. Biological Survey was assigned during World War I, to study the food habits of the American Crow.[1] He wisely concluded that "Bounties can not be recommended, neither can a campaign of wholesale destruction." His second project was to make extensive landmark bacteriologic studies of "Western Duck Sickness, a form of Botulism".[2]

In 1934 and 1935 Kalmbach was sent to the Canadian prairies to investigate the relationship between duck egg predation by the American Crow and the recent continuing drastic drop in duck populations across the prairie provinces. He chose two sites in Saskatchewan, Waterhen Marsh near Kinistino and the pothole country around Prince Albert, and Cooking Lake in Alberta. Kalmbach obtained data on 512 duck nests, of which 49% hatched successfully. Overall, 31% were destroyed by crows, but in the first half of the season this figure rose to 47% of nests and at Waterhen, the locality most affected, crows ate more than half the eggs.[3] However, Kalmbach stressed caution: "if any crow control were to be exercised, it should be confined to federal, state or privately managed areas to which crows have been attracted in unduly large numbers by the presence of nesting waterfowl and on which the consequent delicate problem of control could be kept in experienced hands."[4] The Saskatchewan Game Branch had encouraged Kalmbach in his study, but the Game Branch, ignoring his expert advice, mounted an energetic campaign against crows and magpies.

This began with a crow and magpie egg collecting contest carried out mainly through the schools. In 1936, for example, all 5000 Saskatchewan schools, 4000 of them one-room schools, were circularized. The 443 schools that participated collected 138,620 crow and magpie eggs. Mary Houston remembers accompanying her brother, sister and two neighbour boys on a horse-and-buggy expedition to collect crow eggs for the Edwards school, south of Dilke. The top schools each received a copy of Taverner's *Birds of Canada;* in those depression years this was the only means of securing an expensive three dollar book for a rural school library. Edwards school did not qualify within the top 252.

The second arm of the anti-crow campaign encouraged the shooting of crows by paying a bonus for each crow leg handed in. The first year, 1936, special leg bands were manufactured for the Fish and Game League, bearing SK-36 and a three-digit number. That year, 836 adult crows were banded and 138 crow bands were handed in. Each band garnered at least $5; one random number was worth $100, another $50 and four $25, and a lesser number $10. To anyone in the depression, especially students, this was "big money."

Those SK-36 bands lacked an address and generated no recoveries from the United States. Fred Bard therefore used regular US Fish and Wildlife Service bands for the next two years. He felt it was reasonable to test whether a province-wide anti-crow campaign might help to slow the continuing decline in duck populations. Bard and his assistants caught crows in funnel-top traps, then released them, two every 13 km, on roads around the province. In 1937, Bard banded 490 crows, of which 59 were shot that year in Saskatchewan, 13 in later years and 13 in the United States. In 1938, 253 crows were banded; 30 were shot within Saskatchewan, and 6 in Alberta and 5 in the United States, with another 29 within Saskatchewan in later years. In 1938, the top payment dropped to $50 and only $275 was paid out for the 30 crows and one magpie turned in. Some hunters learned to watch for the glint of sunlight from the aluminum band, and shot banded birds selectively!

Of course, random shooting of

American crow *-Christian Artuso*

a small percentage of the crow population did not diminish crow numbers nor decrease appreciably the number of duck eggs taken by crows. Yet the school campaign, supported financially by the Saskatchewan Fish and Game League, continued until 1958. The government and the League eventually realized, belatedly, that they were encouraging attitudes of destruction rather than conservation.[5]

The hope of halting the duck population decline by shooting crows persisted among otherwise intelligent duck hunters for forty years. In early April about 1975, a medical colleague proudly boasted to me that he had saved the lives of several hundred ducks the day before. “How?” I enquired. “By shooting four crows, each of which would have eaten a hundred duck eggs.” I tried to explain politely his ecological illiteracy, with no understanding of the checks and balances within the “balance of nature.” As a hunter, he understood that shooting of 40% of the White-tailed Deer or 20% of the mallards in a given year is “harvesting the crop” and does not diminish their population, so it was beyond my comprehension how he could claim appreciable benefit from shooting four crows. There are parallels today with those who deny climate change, which I prefer to name “climate chaos”.[6]

One positive achievement resulted from Bard’s crow banding: knowledge of the unusually straight south migration of Saskatchewan crows, following the single tier of states from North Dakota to Texas, differing from most other bird species that trend more easterly along the Mississippi.[7]

1. Kalmbach ER (1918) The crow and its relation to man. U.S. Dep. Agric. Bull. 621.

2. Kalmbach ER (1934) Western Duck Sickness, a form of botulism, with bacteriological contributions. U.S. Dept. Agric. Tech. Bull. 411.

3. Kalmbach ER (1937) Crow-waterfowl relationships. U.S. Dep. Agric. Circular 433.

4. Reeves HM (1984) Edward R. Kalmbach, pp. 82-84 *In:* Flyways: Pioneering Waterfowl Management in North America. A.S. Hawkins, R.C. Hanson, H.K. Nelson, and H.M. Reeves, eds.

5. Houston CS (1970) Wildlife [crow campaigns]. *Fish and Game Sportsman* 2(4):36.

6. Lappe FM (2010) Getting a Grip^{2}. Small Planet Media, Cambridge, MA.

7. Houston CS (1970) Changing patterns of Corvidae on the prairies. *Blue Jay* 35(3):149-155.

YELLOW GRAY JAYS

SUSAN LINGLE[1], PETER IMHOF [1]Department of Biology, University of Winnipeg

During the Easter weekend 2013, March 30 & 31, we spent one afternoon at Emerald Lake, close to Field, BC, in Yoho National Park. With moderate temperatures, we walked on the ice of the lake clockwise along the shore, starting at Emerald Lake Lodge. At the northern edge of the lake, where we joined the otherwise snowed-over trail in the flood plain feeding the lake, we met a group of four birds, which can be most simply described as yellow gray jays. We encountered the birds along the path to the east of a bench (approximately 100-200 m) which is located at a latitude of 51.4507 degrees N and longitude of 116.5328 degrees W. The birds approached us, called out, sat on a hand when it was offered and pecked it - as one would expect from typical jays. Their size and markings were consistent with adult gray jays, with a black cape behind their eyes, black bills, legs, and feet and lighter ear patches and throats. Peterson's Field Guide to Birds of Western North America, 4th edition, 2010, indicates regional variation in Gray Jays: Pacific, Northern, and Rockies. The Rockies gray jay variation has less black on the heads. For the birds we saw, the tops of the heads, areas around their ear patches and beaks, and parts of their stomachs and backs were yellow. Peterson's Field Guide gives no indication of such a colour variance in gray jays. We took some photographs as one of the birds remained perched on a finger. After a few minutes of excitement, we and the birds parted.

Yellow gray jays (Colour images on back inside cover)

SERIES: LEARN YOUR LICHENS

BERNARD DE VRIES email : *bdevries@accesscomm.ca*

LICHENS, TOMBSTONES, and LICHENOMETRY

Have you ever asked yourself how fast lichens grow, or the approximate age of lichens?

To answer these questions we must realize that lichens are a symbiosis of two totally different organisms, a fungus and an algae, unlike vascular plants or fungi, grow very slowly.

The growth rate is not difficult to observe. All we do is finding a common circular species such as *Dimaelina oreina* (Moonglow lichen), and measure its diameter, then photograph or trace it and note relevant data. Come back a few years later to the same lichen and measure its diameter again. Compare this new measurement with the old one, and you might notice a millimeter or two of growth. This little experiment shows that lichens are very slow growers, with the exception of a few, such as *Peltigera* (Felt lichen) which can add about 27 mm per year.

To answer question two we could visit an old rural cemetery with dated and lichen-covered tombstones to calculate, with reasonable accuracy, the length of time it took to colonize a tombstone. One caveat – we must take into consideration the time needed for the first lichens to become established. This methodology, known as lichenometry, has been used to date ancient stone monuments, rock slides or end moraines.

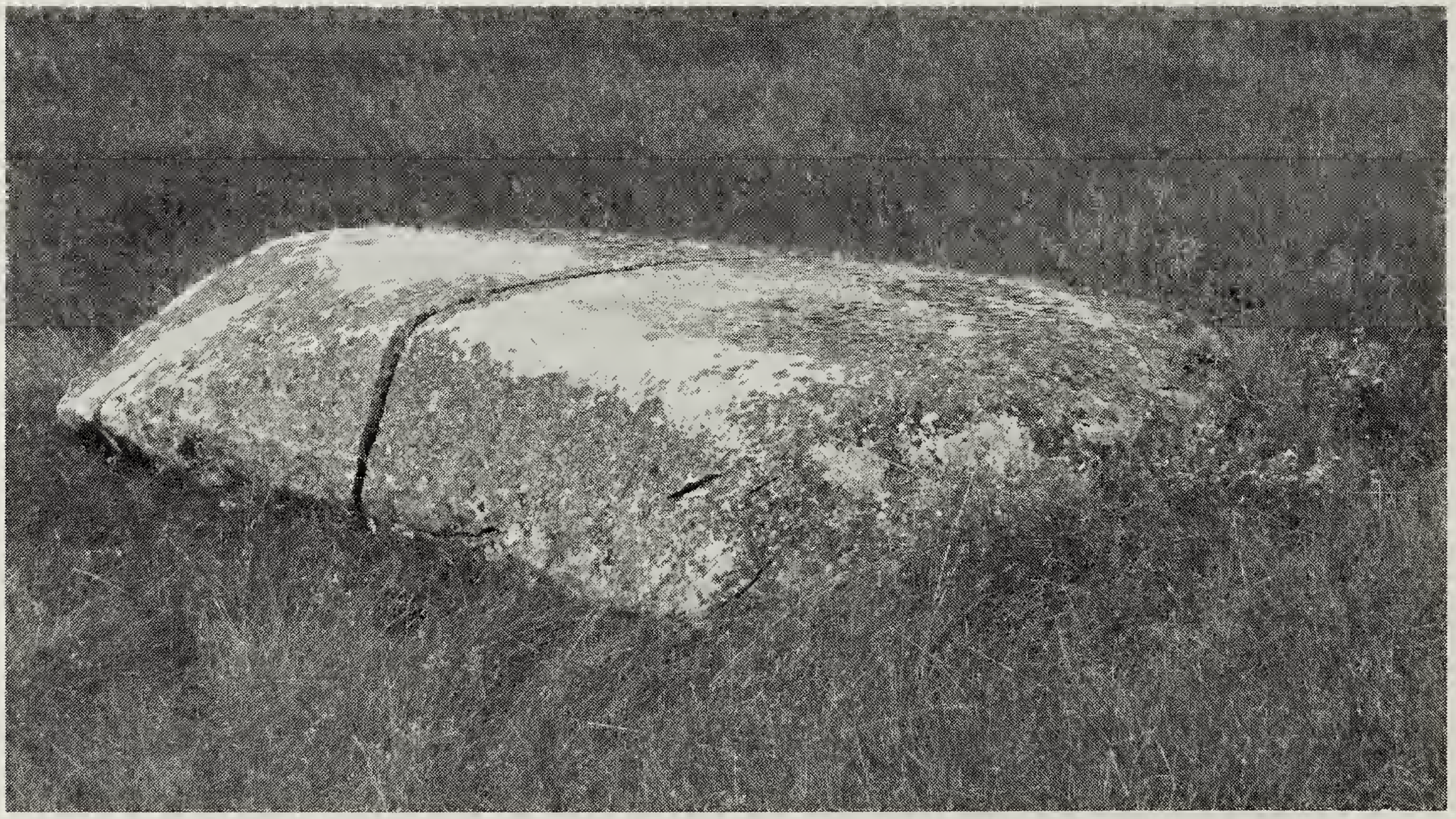
Although most graves have vertical as well as horizontal tombstones, others have but a single horizontal cover often composed of sandstone or cement carbonate, with varying degrees of lichen cover. The photo below shows such a weathered and broken, lichen-covered sandstone grave cover. It was found in an old, no longer used, rural cemetery in southern Saskatchewan along a rural gravel route, south of a long-gone settlement. The substrata of tombstones is important. Polished marble, because of its smooth surface, does not allow pioneer species to colonize easily, and remains mostly devoid of lichens. Granite or sandstone, due to their rough surfaces, are more suited to lichen colonization.

Although weathering of the grave stone obliterated most of the burial date, it was barely legible as "1896". Assuming that colonization took place a few years later, about 1898, we can assume that the approximate age of lichens would be 115 years.

Exposure and moisture, influence lichen growth. Those lichens on an east or west aspect receive less sunlight and retain more moisture through reduced evaporation. East or west slopes often show a greater lichen diversity than those facing south. South-facing slopes are exposed to more solar radiation, and thus have less ability to hold moisture, allowing at best a scanty lichen growth. Exposure and moisture influences must therefore be taken into account when extrapolating the growth rate of a lichen on one dated tombstone to another situation.

The grave stone in the photo below did not have a great diversity of lichen species – only about eight. The predominant lobate species was the common pale orange *Caloplaca trachyphyla* (Desert firedot lichen), with some scattered sub-foliose *Xanthoria elegans* (Elegant sunburst lichen), and the greenish-yellow, lobate to crustose *Dimelaena oreina* (Golden moonglow lichen), which were identified in situ. The other lichens occurred as scattered crustose species, well imbedded in the substratum and only removed by chipping, which for obvious reasons is not allowed in cemeteries.

When on your next field outing you happen to be near an old rural cemetery, you can measure some of the lichens on dated tombstones, and figure out their growth rate. Then you will have a simple method for dating other lichen-covered rocks in your area.



Grave stone lichen *-Bernard de Vries*

IN MEMORIAM: SHIRLEY JOWSEY, 1920-2014

Earl and Verda Upshall, Box 475, Saltcoats SK S0A 3R0. Email: *veupshall@xplornet.ca*

Ida "Shirley" Jowsey, beloved wife of Dr. J.R. (Jim) Jowsey of Saltcoats, Saskatchewan joyously celebrated her 94th birthday with friends in Saltcoats on 29 January, but took ill on February 2, 2014, and died that evening at the Yorkton Regional Health Centre.

Shirley was born January 29, 1920 at Antelope, Saskatchewan, the daughter of Ivar and Margaret (nee: Langford) Sather. She grew up a "tomboy," who loved the outdoors, the sweep of the prairie, the abundant life found in sloughs and creeks, the panoramic night skies, the gentleness and the raw power of the natural world.

In the late twenties and early thirties, Shirley's family lived in Colgate, Saskatchewan. In 1939, the family moved to Star City where Shirley ran the projector at the local theatre. During the war years, Shirley worked at a munitions factory and a float coat factory in Ajax, Ontario. After the war she moved to Weyburn as a theatre projectionist before relocating to Regina where she worked for 16 years at Darke Hall Music Conservatory as a bookkeeper.

During a Nature Saskatchewan Meeting, she met James Jowsey, whom she married July 15, 1969. The couple lived and worked in Regina and in 1977 produced the first edition of the botanical best-seller, *Wildflowers Across the Prairies,* by Fenton Vance, Jim Jowsey and typist, using a standard typewriter; when a single error was detected or a small insertion indicated, she had to retype that entire page. She was also editor and proofreader; the book included her field photo of the Dotted Blazingstar. The acknowledgement reads: "The role of Shirley Jowsey in the development of this book has involved contributions of skill, wisdom, and commitment substantially equivalent to that of the authors." A revised, expanded and even more successful edition by the same three authors appeared in 1984, with the addition of 112 species, 654 colour photographs and a fully-indexed plant family key, all typed by Shirley on a standard typewriter. In

1985, Jim and Shirley retired, moving to the Jowsey farm north of Saltcoats. Fenton Vance died in 1997, aged 90. In 1999, Jim and Shirley brought out a third edition, leaving the plant pages and photographs unchanged, but adding Frank Switzer as fourth author to write the new section on grasses, sedges and rushes, which he keyboarded into a computer.

From the farm, Jim and Shirley often led formal and informal nature and historical excursions, locally and across Saskatchewan. They loved to pack lunches and head out for an excursion. Shirley was one of the main organizers and promoters for several years of Nature Sask excursions such as those to Cypress Hills and Porcupine Plain. She and Jim also made visits to Churchill and the tundra; a highlight for her was a trip to Norway and other Scandinavian countries, and the time spent some winters in Victoria, B.C. For many years she organized, collated and submitted statistics for the Christmas and other Bird Counts. She was a life member of Nature Saskatchewan and a charter member of the YFBTA (Yellowhead Flyway Birding Trail Association) formed in 2003, and a Board member since that time. Shirley was always a staunch supporter and mentor for students hired by YFBTA to lead their summer student program from 2010-2012.

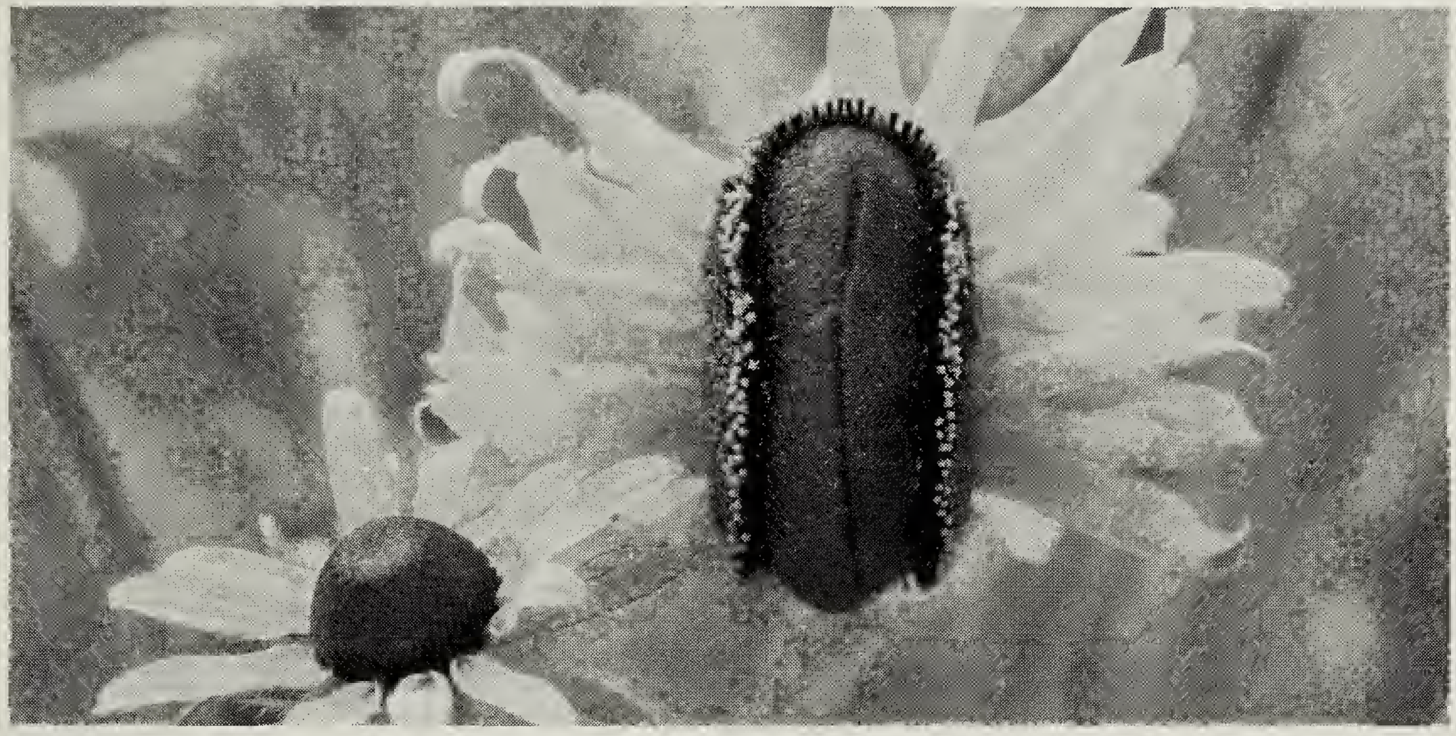
Shirley was an active member of Saltcoats United Church - on Session for many years, a member of the United Church Women, and a generous supporter of St. Andrew's College at the University of Saskatchewan, Calling Lakes Centre and special church programs. Shirley was a lifelong learner, who appreciated Open University and University Extension Programs. Most recently, Shirley enjoyed her participation in the Laketown Leaders, always ready for another potluck, an afternoon of canasta and some visiting.

Shirley was predeceased by her parents, Ivar and Margaret Sather; brothers, Murray and Donald and one infant brother, Raymond; brother-in-law, John Jowsey. She leaves to mourn her passing and celebrate her life, her husband Jim; step children, Harriet Pepper and Harold Jowsey; brother, Milton; brother-in-law, Hugh Jowsey; sister-in-law, Mildred Jowsey; - as well as nieces and nephews.

A Memorial Service was held Tuesday, February 11, 2014 from the Saltcoats United Church in Saltcoats, with Reverends Walter Farquharson and Thom Carnahan officiating. The organist, Ruth Datema, and members of the Saltcoats United Church Choir and Friends led the hymns. Cremation Committal followed in the Saltcoats Town Cemetery.

We thank Christie's Funeral Home, Walter Farquharson and Stuart Houston for their assistance in preparation of this memorial.

MYSTERY PHOTO

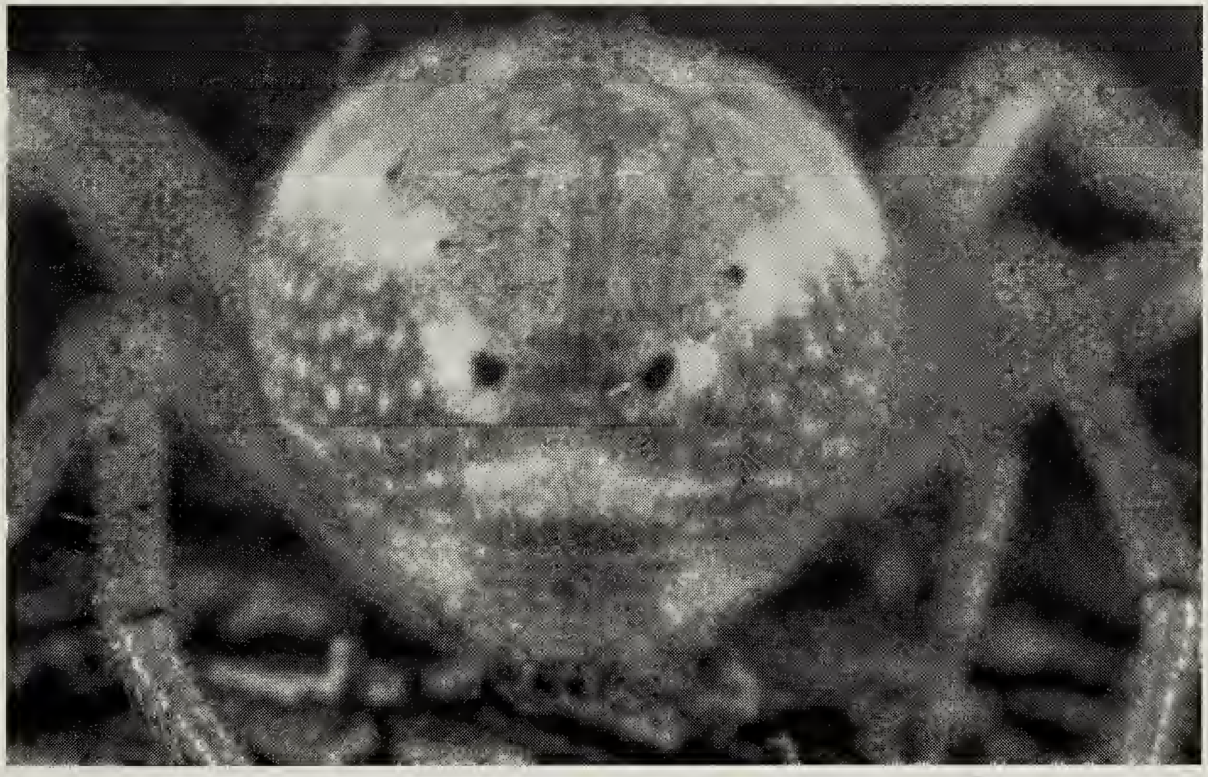


What's wrong with this black-eyed susan (*Rudbeckia hirta* L.)? (See inside back cover for colour image)

Please send your answers to the Blue Jay editors *bluejay@naturesask.ca*

- See back cover for colour photo

ANSWER TO THE DECEMBER 2013 MYSTERY PHOTO:



Blue Jay reader Harvey Schmidt found a smiling face in nature. Being a photographer who specializes in macro (close-up) photography, he managed to get a photo of that smiling face. This spider is an Orb Weaver, *Arianella proxima*. For more photos see Harvey's blog *www.spiders-n-stuff.blogspot.ca*

Unfortunately we received no answers to this particular Mystery Photo, so the prize from Nature Saskatchewan goes unclaimed. Better luck next time!

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Common and scientific (Latin) names are used for all species. Common bird names follow the Checklist of North American birds by the American Ornithologists' Union (7th edition, 1998); mammal names: Mammal Species of the World by Wilson & Reeder; butterfly names: The Butterflies of Canada by Layberry et al.;and names of reptiles and amphibians follow Scientific and Standard English Names of Amphibians and Reptiles of North America north of Mexico, with Comments Regarding Confidence in our understanding, Seventh Edition, SSAR Herpetological Circular No. 39. (Brian I Crother, ed.) (2012).

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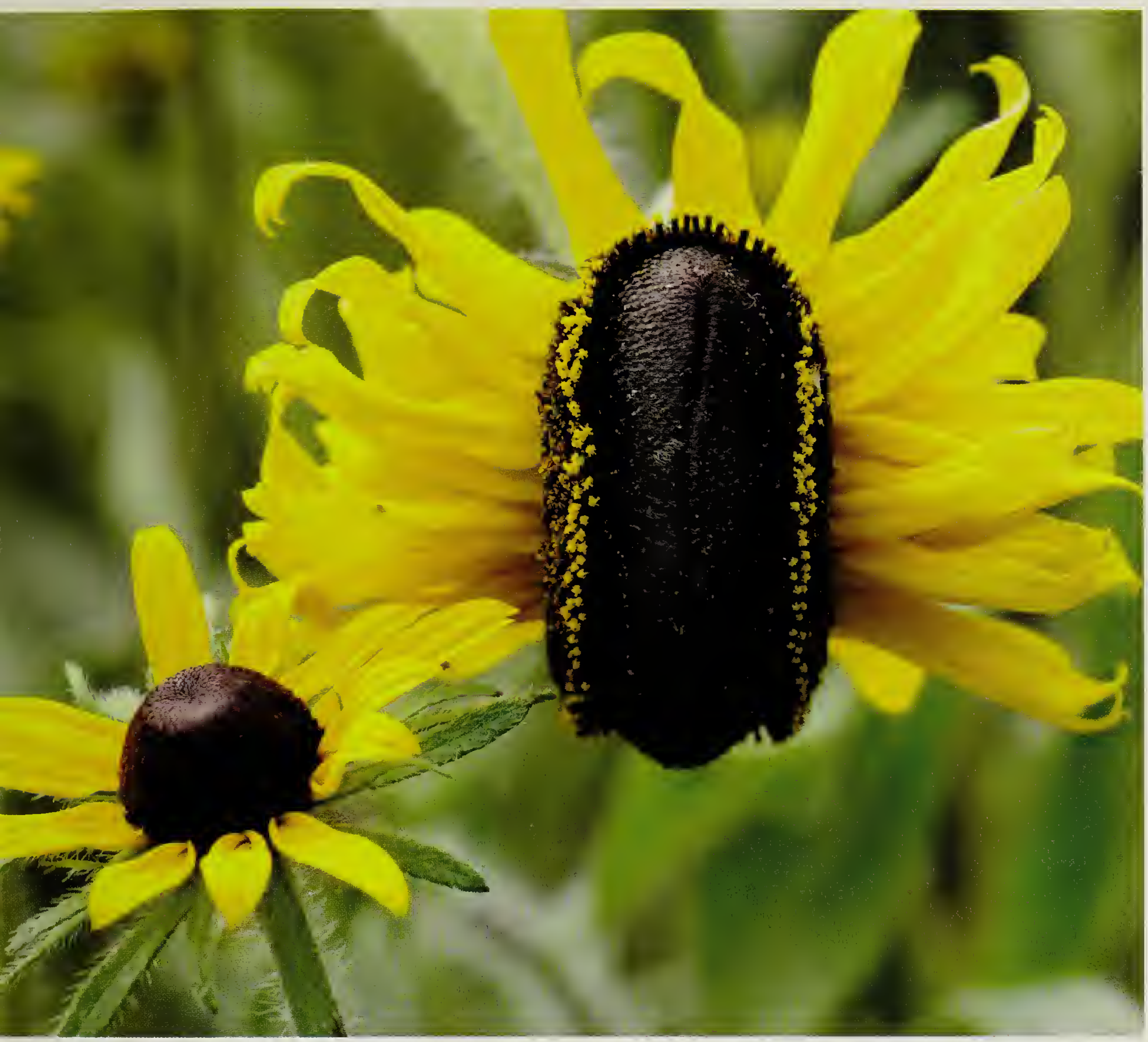
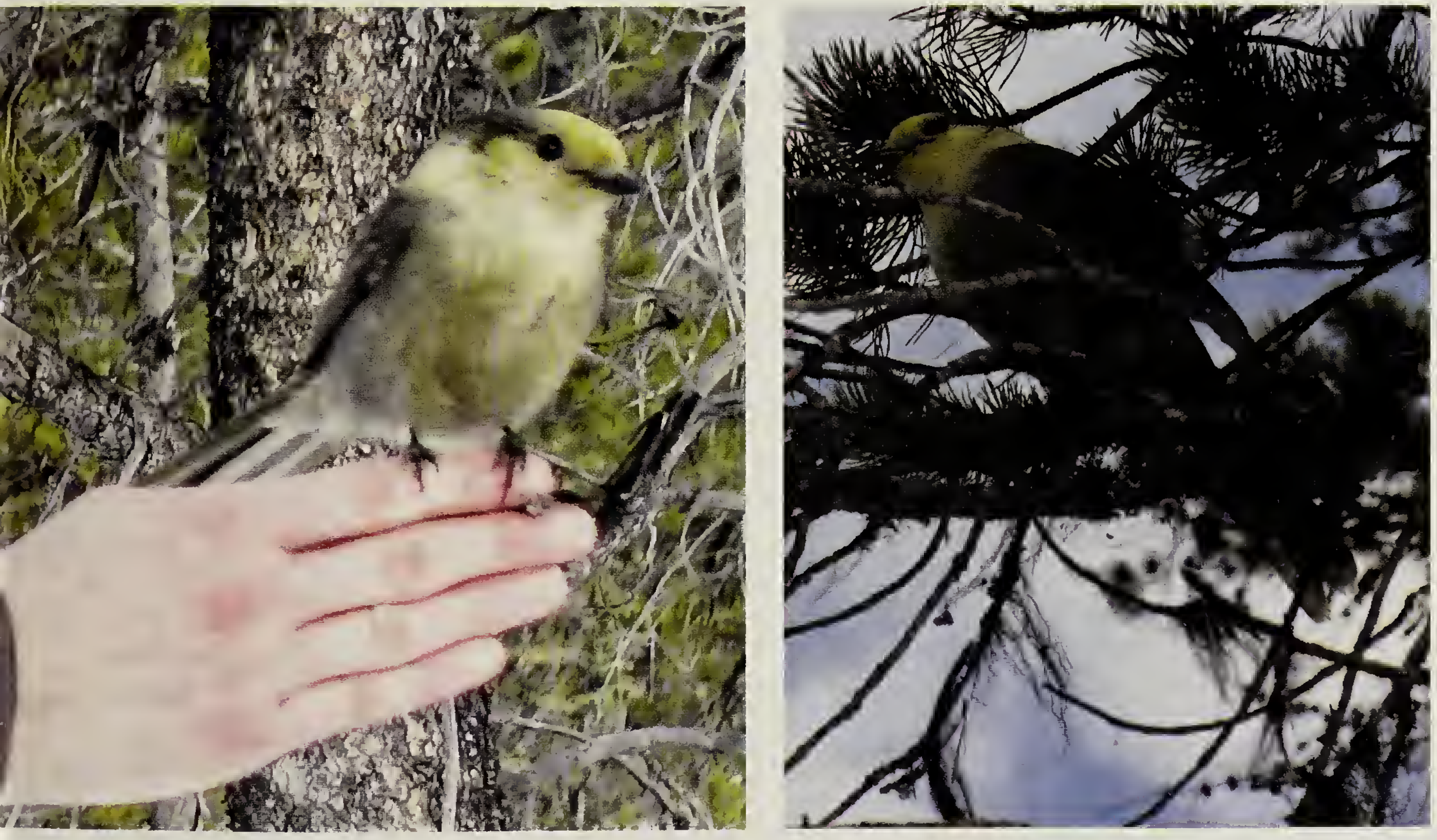


Mystery photo - *Lowell Strauss*



"Yellow" gray jay -*Susan Lingle*

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